





# COMPUTER WEEKLY

Vol. 26, No 655  
Thursday, May 31, 1979

Deputy Editor  
Tony Higgins 01-261 8886

Advertisement Manager  
Harry Hutson 01-261 8359  
01-261 8303

Class Ad Manager  
Brian Durrant 01-261 8597

IPC (Printed) Electronic Press Ltd.  
Dorset House, Stamford Street,  
London, SE1 9LU.  
Telephone: 01-261 8900.  
Telex: 9110 21517 GIBPNS G

Branch Offices:  
Birmingham: 202 Union House, Watall  
Road, Birmingham B7B  
Telephone: 021-356 4838.

Manchester: Southam House, Talbot Road,  
Stretford, Manchester M32  
Telephone: 061-332 4211.

New York: 205 East 42nd Street, New York,  
NY 10017  
Tel (212) 687 2080 Telex 421710

Published weekly on Thursday

Registered at the Post Office as a  
newspaper. Price per copy 18p

© IPC Business Press Ltd 1979.

**CIRCULATION INQUIRIES**  
Requested Readership: 01-537  
3635  
Subscriptions: 0444 59188.

Members of Computer Weekly staff  
may be contacted directly on the  
extensions listed below. Other  
departments in Dorset House may be  
obtained by dialling (01) 261 8900.

**EDITORIAL**

Kelth Jones 261 8346  
Tim Palmer 261 8321  
Peter Hewitt 261 8303  
Rory Johnston 261 8028  
Martin Banks 261 8306  
Robin Webster 261 8170  
Bernard Allen 261 8036  
Donald Konnet 261 8718  
Mike Marples 261 8042  
Don Mitchell 261 8043  
Chris Youst 261 8043  
Nancy Peacock 261 8043  
Judith Morris 261 8043

**ADVERTISING**

Display

Chris O'Hara 261 8858  
Lloyd Collins 261 8743  
Steve Bass 261 8293  
Ian Carter 261 8108  
Wendy Foster 061-872 4211  
Birmingham Ken Parrott 021-356 4838

Classified

Chris Prior 261 8028  
Eddie Farrell 261 8097  
Mark Williams 261 8019  
John Farrer 261 8088  
Ken Walford 261 8457  
Mark Pulver 261 8174

Manchester Owen Kelly 061-872 4211

Birmingham Sadi McGowan 021-356 4838

Production

David Abbey 261 8018  
Steve Robinson 261 8075  
Peter Regis 261 8518

Computer Weekly has a circulation each  
week of over 82,000 including the highest  
fully requested circulation in the UK.  
The international edition, which is  
published 10 times a year has a circulation  
of over 94,000.

Computer Weekly is sent free of charge to the  
following categories in the UK and the only  
computer directory, company statistics,  
management services, staff  
vacancies, recruitment, for computing  
and computer equipment, software  
and hardware, IT Manager/Supervisors,  
systems analysts, data officers, programmers,  
operators, computer students, and engineers.

Subscribed Circulation Department: PO Box  
over Press (Sales & Distribution) Ltd, 45  
Bentley Street, London E14 1BN, Tel  
01-537 3635. Subscriptions for outside the  
UK: Overseas: £10.00 per annum. UK: £12.00  
per annum. CASH: USA, Canada, Mexico: £12.00  
per annum. CASH: USA, Canada, Mexico: £12.00  
per annum. CASH: USA, Canada, Mexico: £12.00  
per annum.

ISSN 0010-4787

**Modata**

30 ST. JOHN'S ROAD  
TUNBRIDGE WELLS (0892) 38881

**DIGITAL MICROSYSTEMS DEC-2**  
LOW COST COMPUTER SYSTEM INCORPORATES:

- ONE MEGABYTE OF Primary Storage on two 8" disk drives - standard.
- 64 Kbytes of Memory - 22K and 48K also available.
- CPU with 100,000 instructions per second - 100,000 instructions per second.
- EXPANDABLE - Add-on Disk System - 100,000 instructions per second.

MODATA AND DOKING FOR DEALERS & DISTRIBUTORS

## The sell-out of the century

It will be argued, of course, that there is nothing sacrosanct about such government holdings, and that the Labour administration in any case sold off 17% of its share in BP and 12% of its share in Ferranti.

That is, indeed, true, and it would be ridiculous to say that no government should ever, under any circumstances, be allowed to sell or vary its holdings in industry. Some flexibility must be retained, if only to enable ventures such as the proposed joint project between Data Recording Instrument and CDC to go ahead.

But there is a difference between selling shares in a company in which the government has a majority interest, as it in fact still does in BP and Ferranti, and on the other hand, organising the wholesale disposal of shares in companies which may be regarded as national assets.

And the morality not to say wisdom, of selling sizeable chunks of companies where the government has a substantial holding, as in ICL where it has 24.4%, Ferranti 50.5%, Data Recording Instrument Co 53.9%, and Case 28% is open to question.

Those companies have been built up - to a very comfortable level of profitability in the case of both ICL and Ferranti - with the aid of the taxpayers' money. And it is strange, to say the least, that we should now be contemplating selling what in effect amounts to national assets, on the open market.

One might ask where the potential investors in these

companies were when money was so sorely needed a few years ago? And why should such investors now reap the benefit of the public investment which has gone into these companies?

Moreover, what would the government's attitude be to bids for their holdings in these companies from foreign organisations, particularly when the military significance of much of Ferranti's computing work is remembered and when ICL's contribution to the balance of trade in computer products is taken into consideration?

But perhaps even more important than these issues is the question of stability and continuity. The high risks and costs associated with the development of computer systems and products have deterred rather than attracted investors. In this situation government support has provided a much-needed stabilising factor, particularly for smaller firms, and indeed even for ICL at the time when the high costs of developing the 2800 series were being incurred.

To remove this stabilising factor, leaving high technology companies to the mercy of the market forces which are supposed to exert such a healthy and invigorating influence on the economy, will be to jeopardise the very existence of the British computer industry when other countries are stimulating and supporting theirs.

Ten years ago...

COMPUTER WEEKLY  
MAY 29, 1969

To provide London polymaths with more computing power, several 1900 machines were installed under a £200,000 plan... An ICL 1900A was ordered for the government communications HQ in Chisleham... At an ICL dinner, "top people" of the industry accepted that there would be a countrywide DP grid, but one was sure of the fact would take.

IT80 venue

A FULL-SCALE five-day conference and exhibition on Information Technology is planned for Monte Carlo in November 1980. Called IT80, it will cover the broad spectrum of integrated voice, data and image systems, and is claimed to be the first major event of its kind. There is room for up to 10,000 delegates. The UK Post Office has already booked their presence.

Executive Conference Organisers are running the event. Information Studies Ltd, handling the conference.

Data prep venue

DATA preparation at the Chester City Council has been switched to two Rediffusion data entry systems which replace Linotype Paul type equipment. Over 60 operations including payroll and rates, and mortgage handled by the RAS which have 16 Mbytes of disc space and are valued at £10,000.

## Viewdata learning system from CAP

RECOGNISING that whatever viewdata standard is finally adopted internationally, there will be a large worldwide market for software, CAP-CPP is concentrating on this sector of the market.

Last week the company unveiled the framework for a comprehensive education by viewdata system, which has been developed by the Department of Industry funding.

Called Telesoftware Training, the system presently consists of tools, at present undefined, designed to enable non-specialists

to create their own course material for running either on a central viewdata computer or, more likely on an in-house viewdata system or "intelligent television set."

Following the change of government there is some uncertainty over whether additional DoI funding will be available to refine the system further. CAP is hopeful, but is also demonstrating the system direct to industry.

The system at present consists of the tools to put together a course, and sample course material. Three courses are currently in preparation: an introductory Microelectronics, an introductory software course, and first steps in programming.

While viewdata will be an appropriate medium for delivering material to the intelligent TV, it will also be possible to distribute it on floppy discs, cassettes, or any medium used by the TV games industry.

With the enormous need for retraining expected in industry over the next decade CAP expects a ready market for Telesoftware Training, which has the advantages that it is intrinsically entertaining, cheap and uses a familiar device, namely the TV set. Limitations are the low capacity of the TV screen and slow communications.

One television rental company has already expressed interest in such a system for training 6,000 repairmen.

CAP's Telesoftware is an extension of the MicroCobol, which is portable across a wide range of mini and microcomputers. It is currently available on IBM's Series 1, DEC's PDP-11, the Zilog Z80, Intel 8080, the Texas TMS 9900, and the Motorola 6800.

## Ex-IBM man to be Gray market chief

TWO years after joining Gray Research from IBM, and subsequently becoming managing director of the UK subsidiary, Peter Appleton-Jones is moving from Bracknell to Minneapolis to take up the post of vice-president for marketing at Gray Research Inc.

His beat will be the Gray world, which presently takes in the US, Canada, France, West Germany, Japan, and the UK, and he will additionally be responsible for customer engineering, product management and software development.

## Wanted: Irish DP staff for jobs in Eire

TO alleviate the shortage in Eire of skilled technical staff, particularly systems analysts, the Irish Ministry of Labour is launching a campaign to entice expatriates with appropriate skills to return from abroad.

An improved resettlement scheme with grants towards house purchase and travel costs will accompany an advertising campaign and a series of interviews.

In addition to systems analysts, other skills listed as in short supply include electronic and mechanical engineers, and

interviewers and toolmakers.

Interviews are being conducted by the Irish National Manpower Services in the major cities of Britain throughout June, and are not being confined to Irish people.

The need for these people is being intensified by the work of Irish Development Authority, which is trying, ironically, to alleviate unemployment in the Republic by encouraging foreign manufacturers to set up factories.

There are large numbers of well educated but inexperienced staff who need opportunities to be taken on as trainees, but before this can be done, factories need to be set up with adequate numbers of experienced staff.

The IDA pays the salaries of trainees who are exporting their products, and in addition, exports are entirely free of tax until 1980. These benefits are confined to exports in order not to impose unfair competition.

Several UK software houses, such as Altergo and Zous-Hermes, have set up shop in Eire solely because of the tax and training grant benefits.

## FCC wants more comms competition

THE US Federal Communications Commission is proposing that any company should be free to offer computerised communications services on the US public telephone network.

This would include the dominant telephone company AT&T, whose proposed Advanced Communication Service has been the subject of a regulatory battle because of doubt as to whether it was a data processing service, which it is not allowed to offer.

But AT&T would have to provide the service through a separate subsidiary company to prevent unfair competition by cross-subsidy from its monopoly services.

The FCC proposals affect three categories of service: voice, basic non-voice and enhanced non-voice, and it expects to announce a firm policy by the end of the year when it has had time to evaluate the public comments it has asked to be sent in by July 16.

An AT&T statement from vice-president for planning William Sharwell said: "The discussion at the FCC confirmed that the Commission is committed to encouraging broad competition in data communications and to promoting innovative new services."

## Plane of own is answer

FOR the businessman who needs to be in several places, if not at the same time, at least as quickly as possible, an aeroplane of his own could be the answer.

For those who want to see the latest aircraft in the Sixth Business and Light Aviation Show, presented by Flight International, is a must. It is being staged at Cranfield, Bedfordshire, from September 5 to 8.

Information about the show can be had from IMA Promotions Ltd, Dorset House, Stamford Street, London SE1 9LU. Tel: 01-261 8427.

## S. Africa likely to go it alone in manufacturing

FACED with increasing international hostility towards its internal policies, South Africa is preparing to go it alone in the manufacture of computers and computer equipment, according to informed industry sources in Johannesburg.

Top-level discussions between key local computer suppliers and senior government officials in Pretoria suggest that contingency plans for manufacturing in South Africa have a high priority.

The government is said to be keen to establish independent internal sources of supply following reappraisal of its relations with the West in general and the US in particular.

It is pointed out that any major break in the supply line from the US would seriously disrupt local computer industry activity which is currently growing at about 35% a year.

Although John Starkey, managing director of ICL in South Africa, is maintaining a tight-lipped silence, reliable sources say the company is drawing up blueprints for the manufacturing operations in South Africa.

Black Clarke, IBM's chief in South Africa, also admits that the company has been investigating the feasibility of local manufacture but says he has, as not been involved in discussions with the government.

The South Africa has the capability of manufacturing computer equipment is beyond

doubt, according to Edward Swanepoel, technical director of Data Corp, which pioneered local manufacturing on a small scale. The biggest inhibiting factor, he said, was the cost of local production for a relatively limited market.

Local equipment, it is believed, would be up to 20% more expensive than comparable foreign equipment and it would be necessary to erect a tariff barrier.

However, many South African suppliers and users believe this would be a small price to pay for independence.

## Bunker Ramo fights bid

THE bid by Fairchild Industries to buy the 79.4% of Bunker Ramo, which it does not already own, may be resisted. The aerospace company launched the \$88 million bid last week (CW, May 24) but has to have the Bunker Ramo board's approval to increase its stake above 21%.

George Trimble, president of Bunker Ramo, questions whether the Bunker Ramo mix of business - it includes computer terminals, electronic components and carpets - would benefit from a merger with a company whose profits are heavily dependent on manufacture of one military aircraft.

## Call of the West

THERE can be few in the DP industry who are unaware that some momentous event is currently happening beyond our shores. The call of the West is stridently summoning all parties to the annual United States DP jamboree - the National Computer Conference held this year in New York.

No self-respecting sales executive, vice-president, engineering manager would dream of being absent from the four-day session - although only a few are likely to get the opportunity to attend.

Being featured this year is a Personal Computing Festival, which is guaranteed to draw even greater crowds, though whether a special "Big Apple" is to be announced, is unknown.

There will, however, be numerous Pests on show which will presumably be kept at a safe buying distance from the large scale IBM 4300s, Amdahls and Crays.

In the meantime, those few of us remaining at our UK work stations, could well be faced with problems. A certain distance will develop between the sales team and the DP installation. Lack of response can be expected, especially from American based organisations. Resources, seldom ample, become decidedly stretched during early June.

Not only do salesmen fall to come running, but engineering service and back-up become noticeably more sparse. Urgent requests are channelled along

routes which tend to get mired midway between California and New York, or perhaps New and California. Feedback - even allowing for time lag compensation - would have troubled even the most tolerant ICT computer manager.

Just who is manning the UK shop is the key question, especially for the installation faced with some dire calamity. Customer responsibility all too frequently takes second place to the requirement to put on good show at the premier exhibition or showcase.

Almost inevitably, the chairman of the NCC Conference is an IBM executive. For much of the computing world, computing is represented by IBM. What the company does this year, the rest will follow as soon as possible.

It is time, perhaps, for the UK and Europe to accept the facts of DP life. Challenging IBM is not only more difficult than surf-boarding on the Thames at Putney. Contestants are guaranteed a rough and wet ride with no towels provided. In the UK, the main competition is provided by ICL, with more than a little help from the government. Even so, their \$1bn turnover puts them in the micro league compared to the computer revenue of IBM at \$22bn. The price of keeping up in the DP technology race is high.

All the more reason, therefore, for casting doubt on the exploits of Iann Barron's State-owned microelectronics enterprise, Immos. Many experts have already concluded that the project will be too little and too late.

The UK does, however, have a strong role in the international world of DP. By providing expertise and establishing skills in such areas as software, consultancy, telecommunications, training and education, we have an unparalleled reputation. Only recently, the CSA announced important UK contracts for software services in Greece and Spain. While such systems houses as Langton Information are spreading WP and viewdata messages across Europe, others are developing new technologies.

The UK could even be aiming for the most comprehensive event. Next year INFO 80 presents in London "The Third International Business Computing, Word Processing and Information Management Exhibition and Conference."

## Accounting study

A STUDY into the practical problems of computerised accounting is being undertaken by accountants Pepper, Rudland and Company, which has bought a 64K Digma M18E processor with 11 Mbytes on disc.

## 1984 and all that...

THIS week's example of the strange things people say in the media about computers was sent in by W. M. Gordon, of Edinburgh Regional Computing Centre, who wins £5.

The health of the police officer is being put at risk by some of the sophisticated equipment being produced into force communication centres. Experts have found that using visual display units can, over a period, cause eye damage to the operators - and even lead to nervous breakdowns.

Scottish Police Federation secretary Joe Black said it had been found that operators using these units often ended up with "bottle bottom glasses" and grey hair.

**Wilkes**

**TERMINALS**

VT100 Video Terminal From £1195

LA180 DECwriter I From £1975

LS120 DECwriter III From £1625

LA34 DECwriter IV From £890

Newbury Lab's latest range of British VDUs From £495

132 col x 24 line VDU with VT52 software From £1285

Perikom Texas Instruments Range of Printers From £1295

HAZELTINE VDU Range From £550

TELETYPE 43 From £865

Qume QUME SPRINT 5 From £2020

**SYSTEMS**

LSI-II Modules available ex stock. Customised to individual specifications.

ALL PRICES EXCLUDE V.A.T.

**Wilkes Computing Ltd**

Rich House, 72 Prince St, Bristol  
Tel: (0272) 290651 or 25921 Telex: 1411

**MEGALEASING**

100% FINANCING

FOR YOUR COMPUTER ROOM

Drinks designed, packaged or conditioning system. Purpose built for computer rooms. - Overseas enquiries welcomed.

**WRIGHT AIR CONDITIONING LTD**

Stamford Road North, Croydon, Surrey CR9 3HU  
Tel: 01-887 775 8421

**WRIGHT AIR CONDITIONING**

FOR YOUR COMPUTER ROOM

Drinks designed, packaged or conditioning system. Purpose built for computer rooms. - Overseas enquiries welcomed.

**WRIGHT AIR CONDITIONING LTD**

Stamford Road North, Croydon, Surrey CR9 3HU  
Tel: 01-887 775 8421

**Datasolve**

**APL isn't everything**

At Datasolve APL is one approach to successful modelling. Not the whole approach. Not the only approach.

Because we look on APL not as a programming language but as part of a service-based modelling environment... Accessible on-line from a far-flung network at major centres in the UK and Holland giving local access.

**Supported** by a team of dedicated APL experts including modelling consultants.

**Enhanced** by a range of APL-orientated products including Datasolve's Financial Planning System (FPS), our APL

Graphics Package and access to our other management products such as our Total Accounting System (TAS). **Complemented** by database management products like Datasolve's Ramis II and IDMS.

For details about Datasolve's services and the economical data storage arrangements for high-volume on-line users, return coupon to:

Product Marketing (APL)  
**BOC Datasolve Limited**  
59 Church Street  
Staines  
Middlesex TW18 4XS  
Telephone: Staines 61644

Send the more information on:

☐ APL at Datasolve  
☐ Datasolve APL products  
☐ Datasolve Database products

Name \_\_\_\_\_  
Position \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_

**BOC Datasolve**



## Downtime

by Chad

### Getting it all together, somehow

JIGSAW puzzle fans will be interested in this story. It seems that at a bank in Texas, following — you guessed it — a "computer error," 200,000 cheques and deposit slips were inadvertently fed into a shredder. Faced with a prospect of years of wrangling and litigation, not to say embarrassment, the bank decided on the well-tried American hammer-and-tongs approach, hired 45 extra temporary staff, and got them back together again. It took a round-the-clock operation, but by the time they had finished, all but 400 of the items had been stuck

back into a readable state. The cross-eyed staff then got taken to a funfair for the day as a reward.

"Now wait a minute," I hear you cry. What on earth is the point of a shredder if the nasty snoopers and industrial spies can just stick the pieces back together again? It sounds a bit like chaining a bicycle to a parking meter — all the thief has to do is lift it over the top.

I remember having great fun feeding reels of punched tape into a shredder. (It was terribly confidential information.) Try sticking that back together with Sellotape!

### COMPUTER WAR GAMES



### Instant underdraft

THE Wall Street Journal had a cartoon the other day showing two people looking at a fruit machine. One says to the other, "It's the latest model. It credits your winnings straight into your bank account."

What a great idea! Of course, it would probably want to debit your losses as well, which doesn't sound so

attractive. But then why not shift the gambling mechanism into the bank's computer, so the whole thing becomes one super-efficient operation? If you felt like it, you could look at your bank account from time to time to see how you stood. If you're going to throw money away you might as well do it as painlessly as possible.

## PO to test 15 System X installations

FIFTEEN System X exchanges have now been scheduled for test installation by the Post Office, and a new digital PABX for 20 exchange lines and 120 extensions, the CDS1, is being evaluated for use as a local exchange in remote parts of the System X network.

In addition to the 800 connection local exchange due to be brought into service in Woodbridge, Suffolk, in December 1980 and the tandem exchange scheduled for London in early 1981, a digital main network switching centre, DMNSC, two more local exchanges and a local administration centre are planned during 1981.

Another two tandems, three DMNSCs and four local exchanges are planned for 1982 and 1983. Four of the installations are to be in London, three in the Cambridge area and the other seven are still being decided.

Production of a working System X exchange has been brought forward, so that the Post Office has had one working since last month in preparation for demonstration on the British stand at Telecom 79, Geneva, in September.

Another schedule that the Post Office has brought forward is the removal of Strowger exchanges, and the last one is now due out in 1992.

Post Office chairman Sir

William Barlow contrasts this with the US where, he says, they will not have a fully modernised telephone system before the year 2000. This is in spite of the fact that they already have 29% of their connections on electronic exchanges, compared with 9% in the UK, and only 26% on Strowger exchanges, compared with the UK's 89%.

Acceleration has highlighted the gap at the small end of the exchange programme, so the new Post Office designed CDS1, now re-christened the Monarch 120, is on trial in Cambridge and in Scotland.

More than 2,000 exchanges in the UK have fewer than 400 connections, and small exchanges suitable for rural areas are also important to the export market.

With the whole of the System X programme the Post Office is expecting exports to bring reduced costs from increased production quantities. Its current rate of expenditure on new equipment is £250 million a year and this will remain steady at 1979 values until all existing equipment is replaced.

The whole of this amount will be on System X once installation starts, and at least as much is expected to be earned in export orders through British Telecom-communications, the recently renamed company formed to export System X.

## WP under fire at Infotech conference

THE importance of word processing as a functional part of automated office systems came in for some statistical attack last week during the presentation by Chris Ellis, manager of business strategy for Nexos Office Systems, at the Infotech conference, "Microelectronics in data processing, the next five years."

He said there was some confusion caused by the common use of the phrase "office systems" to describe word processing equipment, which he said were little more than sophisticated typewriters.

The typical view of the medium to large customer Ellis outlined was that word processing functions were the necessary first building blocks for an office system, while in fact the distribution and retrieval of text would be of more value than more efficient typing. In fact, he said, the productivity gains that could be made

at the secretary/typist level had a minimal effect. For example, in most companies, secretarial staff accounted for less than 10% of costs, and typing for only 25% of that.

Quoting a typical office situation where there were five professionals/managers to each secretary/typist, with the former paid an average of twice as much as the latter, Ellis said that a 30% improvement in secretarial productivity would mean a saving of only 3% in managers' time.

If greater secretarial efficiency also meant less actual secretarial support for the managers, the productivity gains could easily be lost.

Office systems, he said, must centre much more on improving the productivity of a company's managers and professionals rather than its secretarial staff. Otherwise offices will become optimised around the secretaries rather than the decision-makers.

## Bid cash clears way for ADDS plans

WHEN Applied Digital Data Systems finally conceded defeat in the bitter battle with Rascal for control of Milgo Corp, it came out of the fray with a windfall of some \$19 million net, paid by Rascal for the 48% of Milgo shares which accepted the ADDS offer.

Some of it has been spent on buying up some of its own shares, including a major transaction in which it bought out the interest that its most important customer, NCR, held in ADDS.

Some has been invested in a major new plant across the country from its headquarters, New York headquarters, at Salt Lake City, Utah. More is to be invested in building up ADDS' business in Europe, but the company is still sitting on an enormous pile of cash — \$14.1 million in the 1978 annual report — which has caused it to be nicknamed the National Bank of

Hauppauge. ADDS claims to be the largest independent manufacturer of display terminals in the world, and has now built more than 100,000 of them. This business is still dominated by one enormous customer, NCR, which provided ADDS with 39% of its \$48.9 million business in the year to November 30, 1978. The 1978 turnover was up 41% over 1977, and the proportion of NCR business stayed the same.

Over the past couple of years, ADDS has begun to diversify into a second major business, microcomputer systems. The product for this market is the System 75, an enhanced version of the Intel 8080-based System 70. The products consist of display and keyboard, processor, with 52K-bytes of user memory, and up to three floppy disc drives.

Unusually for a business microcomputer, it offers four main packages for different users. The first is an incomplete record package for accountants. The third mode of selling is direct to national accounts — large companies with a requirement for several systems at different



A sales representative telephones his order using MCS voice mail equipment linked to a host processor.

## Voice response system for field salesmen

VOICE response equipment from Menzies Communications Systems will enable 100 main Fiat dealers and 200 General Foods salesmen to input orders direct to their head office mainframes, and have each item checked for correct entry and confirmed — or rejected if it is out of stock.

People in the field are provided with the cheapest kind of terminal you can buy, a 18-button multi-frequency keypad, and even this will be unnecessary when multi-frequency push-button telephones are in widespread use.

Confirmation of the order comes through the telephone in the form of a message made up from digitised recordings of spoken words held on disc. The General Foods system vocabulary is 96 words and Fiat's is 128. Fiat's £124,000 system is being installed at its Brentford, Middlesex headquarters where it will link to an IBM 370/138 and a Digital Equipment PDP-11/70 on the same site, as well as to another 11/70 at its parts distribution centre in Warrington, Lancashire.

In managing these links the

MCS system will enable three computers to communicate with each other, will also link IBM 3270 terminals on a local multiplex line into the 370/138 for enquiry.

Fiat's system will also link dual tape systems giving option of batch operation providing backup. It will communicate with the IBM 3270 emulating a 2803 cluster controller.

At General Foods the MCS system will also link IBM 370/138, but will emul-3270 display controller and not do any other communications front-end processing will not have the magnetic operation.

Due to be installed at Oxford, Oxfordshire, by the end of the year, should be fully operational by six weeks after installation. Both systems will have capacity of 15 telephone lines.

THE MCS system is based on modules from Perphenix US, a subsidiary of Extronics, also owns microprocessor maker Zilog. It uses a PDP-11 processor.

## EMI scanners pick up again

BUSINESS at EMI Medical, which has been feeling the keen breeze of competition from US and other scanner manufacturers, looks to be picking up, with 10 orders for scanners placed in April.

Three Italian hospitals, at Lecce, Bologna, and Genoa, will receive two CT 1010 specialist head scanners and a 7020 high resolution scanner, together worth about £200,000. They are due to be delivered in mid-1979. Scanners are also going to

Austria, West Germany, Saudi Arabia and the UK. The scanner uses X-rays to construct a cross-sectional image of the body. EMI's scanners, with scan time of 12 seconds, are slower than those of some competitors, but EMI claims that they give a higher quality picture.

The next generation EMI scanner, the 7070, will combine high definition with a second scan time.

## plans

locations. "The end-user price comes at about \$10,000, including software," says John B. Cooper, managing director of ADDS UK.

ADDS now wants to expand its business in Europe, and has recruited John Cooper, formerly with the European office of the American company, to head the European operations. Cooper is working out of a new quarters in London.

approach on the Continent, a mirror that in the US, the reference that ADDS has placed in the bank to ensure future, are the key selling points for its products. "We took a system to Yugoslavia in 1978, and the Carvevate to demonstrate four cities and a general idea of it. It opened up a new time was played in Belgium."

## Micro-controlled car route planner developed by VW

VOLKSWAGEN is developing a number of microprocessor-controlled applications for on-board car instrumentation. The most interesting is LISA, a German acronym for Driver Guidance and Information System.

The visible part is a small console mounted on the dashboard where the driver can easily consult it at speed (see picture). The console comprises an extended numeric keypad, a single line numeric display, and a graphic display, all controlled by a microprocessor and memory within the console box.

At the start of a journey, the driver keys in the destination code of the town or village to which he is travelling; this will have been obtained from a map or guidebook. The display confirms the code that the microprocessor has stored.

As the journey progresses, the car passes occasional sensor cables in the road. LISA's microprocessor transmits to these the car's destination code, and receives in return coded instructions on the fastest and least congested route for getting there. LISA translates these into a simplified map instructing the driver when and where to turn off.

The roadside sensor cables in turn are connected online to a police traffic control computer system, into which the police can key information on traffic bottlenecks. The computer uses this, and LISA destination codes, to calculate optimum traffic distribution patterns, and to vary routing advice given to cars.

An experimental area of six interconnecting motorways and main roads in the Ruhr has been equipped with sensors by Volkswagen in association with Blaupunkt and Ingenieur-Büro Henschel and Rosenfeldt under a

## S. Africa growth plan

Edmond Frank reports from Johannesburg

PROJECTIONS based on the results of the latest survey of the South African computer industry by the Department of Statistics in Pretoria suggest that the country's installed computer base should be worth £41,176,470 by the end of June.

The survey shows that the value of the country's total installed computer base grew at a compounded annual rate of 27%, from £167,647,050 in 1973, to £270,388,230, between June, 1973, and June, 1977. The official figure is not yet available.

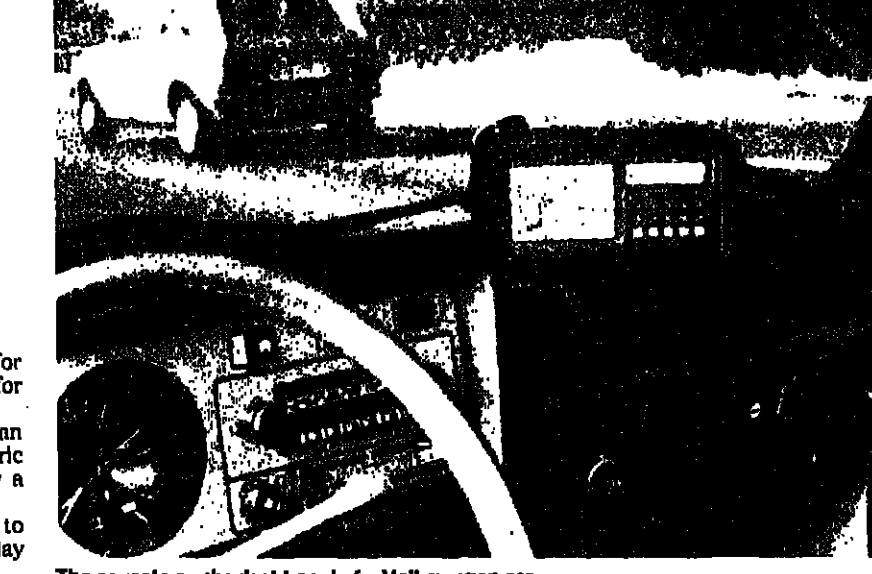
John Starkey, ICL's managing director in South Africa, says the growth rate, which has been maintained at between 20 and 30% a year over the last five

## DP staff crisis in US

SHORTAGE of qualified people to fill DP posts has been identified as the most serious problem currently facing managers of State government information systems in the US.

In its annual report, the National Association for State Information Systems (Nasis) states: "No other problem has shown the dramatic reversal of impact as has the recruitment of personnel. Since 1971, it has moved from last place to first place as the most serious external problem."

The report goes on to point out that the inability to recruit and hold sufficient competent



The console on the dashboard of a Volkswagen car.

## US technicians' strike hits Univac plant

THE first major strike in the computer industry occasioned by President Carter's anti-inflation guidelines has hit Univac's Twin Cities plant at Minneapolis-St Paul.

The plant is the sole source of Univac 1100 series CPUs, and 2,700 electronic technicians went on strike demanding an increase of 10% plus a fringe benefits package bringing the

total to between 13 and 14%. Under the guidelines, Univac says it can offer only 7%.

The last strike at the plant was in 1967, and lasted 17 days.

Analysts believe that Univac, as a major government contractor, will feel obliged to stand firm on the guidelines.

The newest 1100, the forthcoming 1100/60, will be built at the plant. As exclusively

revealed in Computer Weekly (May 17), the 1100/60 is a bit-slice emulation of the 1108, using multiple parallel processors built out of Motorola 10800 4-bit micros to achieve a performance of 1.2 mips.

Use of the new technology has enabled Univac to make a dramatic reduction in the size of the 1100/60 compared with its predecessor, the 1100/40.

The number of circuit boards is reduced from 1098 on the 1100/40 to 160 on the 1100/60, and CPU floor space is reduced from 52 to 12½ square feet. One Megaword of memory takes up less than one-third of the space of 512K-words on the 1100/40.

The 1100/60 makes its debut at the National Computing Conference in New York at the beginning of June.

## If there's going to be a mess on the line Analysis II will spot it



The picture above shows that lines of communication are not always trouble-free. Data travelling along telephone lines is just as likely to run into difficulty.

That's where Analysis II comes in. The network control system watches over the line, the modems and the terminals — to

spot faults quickly, and warn the operator. Analysis II is simple to operate, and inexpensive to install.

Who knows? It could pay for itself in the first few minutes of use. Find out more. Talk to CASE.



**ANALYSIS II**  
from CASE  
the intelligent solution

C.P. COMPUTER SUPPORT SERVICES

## SCOPE-2903

THE TELEPROCESSING MONITOR FOR ICL 2903/4

- WRITTEN ENTIRELY IN COBOL
- RUNS UNDER ETS/MTS
- USES ICL'S DIRECT ACCESS HOUSEKEEPING
- ACCEPTS USER MODULES IN COBOL AND/OR PLAN
- FULLY 'DRIVER' COMPATIBLE (WILL ACCEPT DRIVER BEADS)
- AUTOMATIC HARD COPY PRINTER BUFFERING
- AUTOMATIC 'MENU' SCREEN GENERATION
- PASSWORD SECURITY
- BROADCAST FACILITIES
- MESSAGE INTERPRETATION/ERROR HANDLING
- CENTRALISED FILE HANDLING
- FULL SECURITY/RECOVERY SYSTEM
- SCREEN FORMAT SET-UP
- BATCH MODULE TESTER
- VT TRAFFIC STATISTICS
- FULL DOCUMENTATION PROVIDED (SYSTEMS/REFERENCE/OPERATING MANUALS)
- SOURCE PROGRAMS PROVIDED
- FREE INSTALLATION SUPPORT
- DEMONSTRATION SYSTEMS AVAILABLE
- BASIC PRICE £3,500

For further details contact  
C.P. COMPUTER SUPPORT SERVICES  
HAYMARKET HOUSE  
HAYMARKET CENTRE, LEICESTER  
Telephone: 0533 23937/8

## PT7 TERMINAL SYSTEMS

advanced alternatives to IBM3270 and ICL7502  
for details contact PT7 Sales  
061-437 5391

Swinsway, Manchester M22 5LA  
**FERRANTI**

## NOVEL METHODS OF DATA TRANSMISSION

ARE BRING TO THE TOP OF THE TREE TO THE DON'T LET NEWLY HATCHED IDEAS ESCAPE YOU OR TO BIRD BRAINED SCHEMES!  
Ring 01-421 0626 (9 lines)  
Telex 824 814 (Robots G)  
MODULAR TECHNOLOGY  
P.O. Box 117, Watford, Herts. WD1 1AP

COMPUTER AND SYSTEMS ENGINEERING LTD  
Woodcock Hill Estate, Harefield Road  
Rickmansworth, Herts WD8 7PL, England  
Telephone 082 3778999 Telex 923925



# MICHIE'S PRIVATEVIEW

## The chips blues

AT an early age an indissoluble connection formed in my mind between the romance of technology and the ideals of socialism.

I remember a street stall in my home town over which flowed an endless stream of dilapidated secondhand books priced indiscriminately at tuppence. Like any pig rooting for truffles or forty-niner panning for gold, I would rummage with meticulous care for works by H. G. Wells.

Reason and disciplined enquiry, the manifest source of these dazzling marvels of today and tomorrow, could not the same methodology be applied to society itself? Could not a serenely regulated utopia be caused to emerge from mankind's jumble of marvels?

So Tony Benn's white-hot technological revolution of some 10 years ago, and Jim Callaghan's recent promotion of "chips with everything," seem to fit.

But when looking at the area of computing for signs of real scientific planning, I have been finding over the past few years a strange reversal of traditional roles of Left and Right,

with Labour remaining stubbornly laissez-faire while Conservatives draw up detailed blue-prints for information technology and the management of its social impact.

Computer Weekly readers have sampled some of the thinking of Ian Lloyd's information technology group (CW, April 5). Other studies have been pursued by Philip Virgo's Conservative Computer Forum. Virgo's latest output "Cashing in on the chips," shows further evidence of Tory homework behind the scenes.

The unemployment threat is carefully analysed, and its true nature is revealed as more concerned with change of jobs rather than with any net loss of jobs.

The unemployed cannot move to where the jobs are, because they can't get homes there, and even if they could, they lack the skills in demand or don't want the unskilled jobs vacant.

Obstacles are further ana-

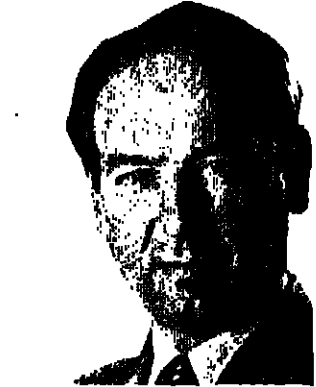
lysed into:

- Fear of unemployment, rational under present conditions;
- difficulty of changing jobs without abandoning accumulated pension rights;
- difficulty of learning new job skills;
- difficulty of moving home; and,
- planning, legal, fiscal and other obstacles to starting one's own business.

To me the most intriguing single recommendation was "to change the standard public sector working week to three days of 10 hours and one of five (for the overlap) and open all government offices from 9 am to 7 pm for six days a week."

Why not generalise this to private sector employment, with obligatory subsidy by the employer of an additional day in the week for educational release?

Perhaps this, like some other variants of the 35 hour-week,



would commend itself more to the trade unions than to Virgo's group.

It is, alas, one thing for back-room analysts like Virgo or Lloyd to show vigorous awareness, but Ministers are a breed apart.

Sir Keith Joseph's hoped-for appointment of a Minister of State for Information Technology, surely a minimal step if serious intent exists, has not materialised.

I and some others hope to obtain an opportunity to put Sir Keith to the question. Views from readers before we go would be very welcome.

### Reference

"Cashing in on the chips: a policy for exploiting the semiconductor revolution," by Philip Virgo, 22pp. Obtainable from Mr Virgo at 2 Eastbourne Avenue, Acton, London, W3.

## SOFTWARE FILE-1

### First Algol 68 for Honeywell Multics from Bath centre

THE first Algol 68 compiler for Honeywell's Level 88 Multics — and one of only a handful yet developed for any machine — is being implemented by the South West Universities Regional Computing Centre.

Intended for the Level 88/DPS system at Bristol (CW, December 21, 1978) the software will be a re-implementation of the Algol 68 RS compiler developed for the ICL 2900 series. This was delivered to ICL recently following joint development by the centre with the RSRE, and the Oxford University Computing Service.

Expected to be released as an ICL product in the next few months, it is already running on the 2980 operated by the centre at Bath; it is the availability of Algol 68 RS on the regional network which has prompted demands for a similar compiler at Bristol.

Algol 68 RS originates from a portable compiler project at RSRE and is written almost entirely in Algol 68 itself. The task of converting it thus consists mainly of writing a new code generator.

Even so, a substantial effort is involved estimated by the centre at five man years. It expects to have a usable compiler available in the last quarter of 1980 and to complete the project in the first quarter of 1981.

Given the small number of Multics sites worldwide, one aspect receiving careful consideration is the scope for a further implementation under Honeywell's more widely used Gcos operating systems on the Level 64 and Level 68.

According to the centre's project manager, Martin Thomas, the Multics compiler will not be able to run on such systems without modification. It may though be possible at this design stage to minimise the future effort required.

The team is therefore investigating the scope for design trade-offs consistent with exploiting Multics' architecture to

the full in the interests of performance.

The paucity of Algol implementations to date held back its acceptance as a mainstream programming language. It is however the US as a potential competitor to PL/I, both being large purpose languages.

A key difference from PL/I, that instead of being portable, Algol 68 is deliberately non-portable. As a result while it is generally easier to get a program to compile, an Algol program will typically be less easy to debug.

Thomas is optimistic that the 2900 compiler will see significant commercial use, arguing that Algol 68 is naturally suited to structured design methodology, that Cobol and Fortran currently not.

Although ambitious new Fortran and Cobol standards are currently being defined to incorporate "structured programming" concepts, implementation is some way off.

By contrast, Algol 68 is available now and is a proven language.

He admitted though that an obstacle could be the fact that the 2900 compiler does not support DBMS calls. This feature could be added with relatively little effort, he thought, at the centre's continuing development and maintenance of the compiler.

In addition to applying programming Algol 68 can also play a role as a system implementation language and the centre is looking at the 2900 version as a possible substitute for ICL's Algol 68 RS.

The Multics and Gcos implementations are thought to bring to about half-a-dozen numbers of full Algol 68 compilers in existence. Others include Cambridge's Algol 68, the 380 and 370; Manchester's Algol 68 R for the 1906, and CDC implementation installed by four UK universities last year (Software File, January 1978).

There is also a subset of Algol 68 S, which is available on the Modular One and several other minicomputers.

### US debut for latest version

HONEYWELL has released a new version of its Multics operating system which according to US reports has enhanced communications, batch processing and reliability features.

Available at no extra charge, to existing Multics users, the release supports a new maximum of four front-end network processors; the Datamet 8870 processor; the Vio 7800 family of terminals; and IBM's 3780 RJE terminal.

There is also a new optimiser for the Fortran compiler, which together with an enhanced runtime library improves Fortran program performance.

Other enhancements include the addition of the timesharing facility TSS to the Gcos simulation environment; improved batch operating facilities; and the addition of main memory testing routines, enabling the system to reconfigure around faulty memory blocks.

The reports added that a transaction processing monitor could well be the next major addition to the system, and may be released before the year end.

## SOFTWARE FILE-2

### Ventilation design subsystem

A VENTILATION design subsystem has been added by Applied Research of Cambridge to its Oxys computer aided design package. Called Xduot, it was developed

for the Oxford Regional Health Authority and is an integral part of Oxys. It is also linked to BDS, the general purpose building design system developed by ARC from Oxys.

## Clear growth path now opens on IBM Series 1

A NUMBER of critical Series 1 superstructure products previously announced for RPS only are being implemented by IBM under the other main Series 1 operating system, EDX. They include a Cobol compiler, the transaction processing system MTM, the indexed access method, and sort/merge.

The announcement, made in the UK last week, means that a clear growth path is now open from an entry level EDX system to a fully functional RPS machine. Commonality between the two operating systems was previously restricted to the Fortran IV compiler, which was announced for EDX in January (CW, January 18).

Likely to be one of the most popular of the new Series 1 facilities, MTM (Multiple Terminal Manager) was released under RPS in March. It supports a library of predefined screen formats accessed by transaction processing modules in Cobol.

Fortran, and PL/I. Just two steps will now be required to transfer a typical Cobol or Fortran-based MTM application from EDX to RPS: program recompilation and the re-entry of screen formats.

MTM will be available under EDX in October for a monthly rental of £8.25 or a one-time licence fee of £403.

The EDX Cobol compiler, due to release in July, is a compatible subset of the Cobol compiler under RPS — itself a subset of OS/VS Cobol release 2.0. It will be available for a rental charge of £38.90 and will sell for £2,332.

The RPS Cobol compiler is one of number of major RPS products due to be released this month in association with RPS Version 4B.

One of the most interesting of these is the Command Language Facility, an online development system. The two components of CLF are a multi-user interactive session manager and a com-

### Operating system for Rjad range to get 370-type facilities

THE operating system of the Rjad unified range of mainframe computers is currently being developed to offer the kind of facilities which IBM introduced over the two or three years following the introduction of System 370.

Called OS/ES, the operating system is currently up to release 6.0, which was introduced early last year, and supports virtual memory for the first time. According to the East German company Robotron, which builds the largest Rjad machines currently available, the new stages of sequential, indexed sequential and direct access methods.

Three forms of multi-programming will be supported in OS/ES: multiprogramming with a fixed number of tasks, multiprogramming with a variable number of tasks, and single virtual storage, SVS.

SVS will provide a single virtual storage space of up to 16 Megabytes, and will only be usable on models which include dynamic address translation.

These are the ES-1035 from the USSR, the ES-1045 from Poland and the USSR, the ES-1055 from East Germany and the ES-1065 from the USSR.

The 1065 is being developed alongside a new design for the 1080, which was to have been included in the earlier range, but never went into volume production, and has now been modernised, for inclusion in the new series the Rjad-2.

Release 6.1, due in March 1980, will be followed about 18 months later by 6.2. This will include multiple virtual storages, MVS, allowing up to 16 Megabytes for each user.

Programmer Notes will be resumed next week.

The 6.0 release includes better facilities for error recording and tracing, and a job entry subsystem and job steering facilities are under development.

The massive development effort going into developing all this operating software raises the question of why the Comecon countries did not simply "do an Amdahl."

Users of Rjad machines say that IBM 360 operating systems can be modified, and run after at most trivial changes. Equally programs written to run under 360 operating systems will run under OS/ES.

The answer is that like many Western European countries — for example the UK and Israel's 84K RAM — the Comecon countries feel a need to master the whole range of the technology for themselves, lest someday they be cut off from it altogether.

By Peter Hewitt

## RTZ to market prize-winning ledger pack

COMPETITION among UK software houses to win marketing rights to an award-winning mainframe general ledger package has been resolved in favour of RTZ

Computer Services. Developed by McCormack and Dodge, of Newton, Massachusetts, G/L Plus first appeared in the US a mere 18 months ago. Since then it has

achieved the coveted distinction of an ICP \$1 million award, thought to be a record for first year's sales of any application package.

The package was also acclaimed by users responding to Datapro's annual software survey for 1978, its lowest rating in all categories far exceeding that achieved by competitive packages in any category.

RTZ will be marketing G/L Plus in the UK and Holland, initially to IBM 360/370 users. At its own expense, it is converting the software for ICL 1900/2900 systems and expects to complete these versions by Christmas.

The system, which is written in Ansil Cobol, is also supported on Honeywell's Level 68 series. Largely parameter driven, a major feature of the package is its flexibility. Different company reporting requirements can be met from one copy of the package via user-defined format.

On the input side, it provides a front-end translator capable of reformatting files passed from other applications, such as an existing purchase ledger.

Predominantly batch, the sys-

tem is due to be enhanced later this year with a number of online facilities. First to be released will be online edit and inquiry routines and these will be followed by software for online auditing.

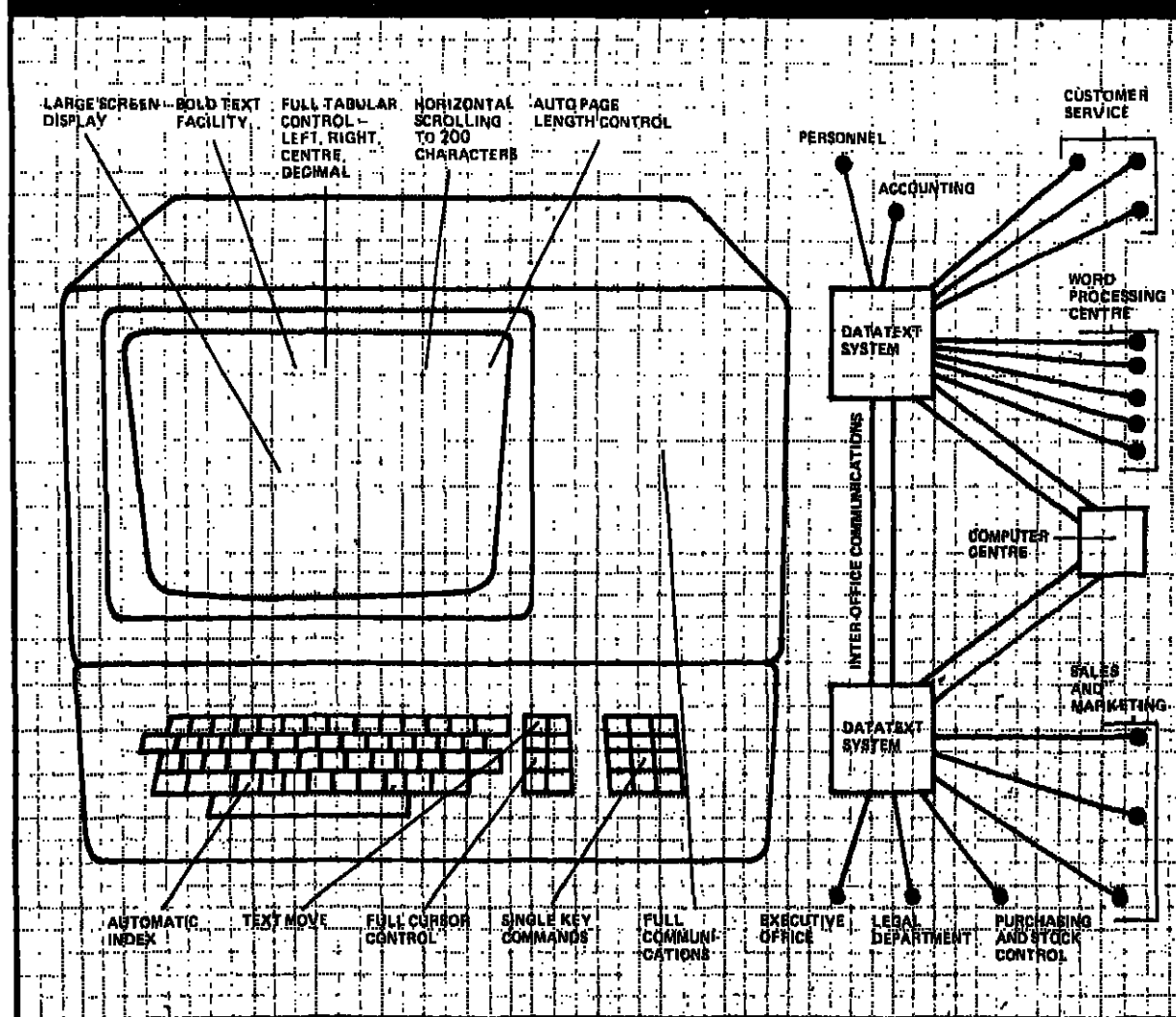
The package already provides a batch auditing subsystem together with routines for financial modelling and planning.

McCormack and Dodge, whose sole business is the development of financial application software, has so far made around 70 sales of G/L Plus in the US. Some 850 companies have purchased M&D packages.

Unlike the general ledger, however, the other financial applications are likely to require non-trivial modification for the European market and are unlikely to be launched by RTZ before the end of the year.

UK prices for G/L Plus are £24,000 for the QS version and £22,000 for the DOS, with a 10% maintenance charge after the first year. The management reporting and financial modelling subsystem, Fast, is priced at £4,000.

## Careful planning always gets the best results.



### DataText. The master-plan for shared logic word processing

In any word processing system, the more careful the planning, the more efficient the result.

And the DataText shared logic system is designed, planned and prepared specifically for your word processing.

From its functionally designed keyboard to the clearly readable screen, from its full communication for integrated network systems to its ability to type form letters at 540 words per minute on each printer, and maintain up to 40,000 pages of information at the same time.

Add to this a nation-wide back-up service of software, programming, support and hardware maintenance handled by the same company, and you've a master-plan for a cost-efficient shared logic word processing system.

**GCS TELETYPE** COMPUTER PRODUCTS INC.  
General Computer Systems (UK) Limited  
Orion Park,  
228-236 Northfield Avenue  
London, W13 8GU  
Telephone: 01-678 8401  
Telex: 897368 GCSLON

For more information on this and all the DataText systems, simply post the coupon today.

Name \_\_\_\_\_  
Position \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
Postcode \_\_\_\_\_  
Tel. \_\_\_\_\_

Systime Ltd, Concourse Computer Centre, 432 Dewsbury Road, Leeds LS11 7DF Tel: 0532 707411

# SYSTIME



## NEWBURY

SMART  
MICRO-BASED  
VISUAL DISPLAY  
TERMINALS

## Model 7008-7009

- \* British design and manufacturer
- \* Based on 8080A Microprocessor
- \* Two-page Memory 3.840 characters
- \* 24 Displayed line of 80 characters per line
- \* Switchable Transmission Speeds from 60 Baud to 19,200 Baud
- \* Split Speed Transmission Mode
- \* Dual Interface - CCITT V24 and 20/80 mA Current Loop
- \* Hard Copy Printer Output
- \* Protected Field Format - Blink - Background or Half Brightness
- \* XY Cursor Address (send and receive)
- \* Roll or Page Mode
- \* Video Output for External Monitors
- \* Full Character Editing Features
- \* Block Transmission from Screen by Line or Page
- \* Green Phosphor Non-glare screen



## Models 7001-7002

- \* 24 Lines of 80 characters per line
- \* Selectable Baud Rates from 50 to 19,200 Baud
- \* Dual Interface - CCITT V24 and 20/80 mA Current Loop
- \* Teletype Compatible
- \* Hard Copy Printer Output
- \* Selectable Half or Full Duplex
- \* Video Output for External Monitors
- \* Green Phosphor Non-glare screen



## Model 7000

- \* Teletype Compatible
- \* 24 Lines of 80 Characters per line
- \* Selectable Baud Rates from 60 to 19,200 Baud
- \* CCITT V24 Interface
- \* Selectable Half or Full Duplex
- \* Green Phosphor Non-glare screen

## PRICES FROM £485

**NEWBURY  
LABORATORIES LTD  
HEAD OFFICE & SALES  
KING STREET ODIHAM  
HAMPSHIRE RG25 1NN  
TEL: 025-671 2910  
TELEX: 858815**

Manufacturers:  
Archibald Road, Newbury, Berkshire  
RG14 5BU  
Tel: 0635 48864  
Service Centre:  
Bonne Lane, Newbury, Berkshire  
RG14 5BN  
Tel: 0635 48898  
Northern Area Sales & Service:  
2 Galloway Road, Chesham, Cheshire  
SK9 1PY  
Tel: 061-491 0134

## OP SPOT

## Call for govt survey into effects of shift working

"THE government should carry out an in-depth investigation into the effects of shifts — not only in the computer industry but also in other areas where they are worked."

So writes Pete Rushton, a shift leader at Manchester University, in response to the fact that an operator was advised to give up shift work by his doctor, who described him as being in a state of permanent "jet lag" (Op Spot, May 10).

He goes on: "Operations staff should be given medical check-ups on a regular basis — I agree with you entirely on the matter. 'But might I add that a medical should be given to a person before he is actually taken on as an operator, in order to be sure that he is fit enough to work shifts.'"

According to Rushton, operations staff must be involved when the rota is worked out because, at some installations, the management just don't

appreciate what working shifts entails.

"We are the ones who have to work the rota, and so we should have a say in which one is adopted, rather than have it thrust upon us by someone who doesn't know what it's all about."

At his installation, there are four teams, each comprising eight operators, working a 12-hour shift pattern to provide 24-hour cover seven days a week.

He continues: "We worked out our own version of the 12-hour shift system four and a half years ago and it works extremely well for us."

"We like the system because it gives us rest periods between shifts. This is good because a certain amount of time is needed to adjust and 're-charge' before starting the next period on shift."

"And our operators aren't constantly changing from days to nights, and vice versa, like the

unfortunate chap you mentioned."

Rushton makes some very interesting points and, in my view, the one about operator involvement in deciding upon a shift pattern, is of particular significance.

At one installation I know of, the operators worked days only until the ICL system was replaced by IBM kit and a two shift system was implemented.

Now a senior member of the operations staff — a person who, at that time, had no experience of shift work — insisted that the operators work a long day shift and a short evening shift. Despite the fact that several of them objected to it, the operators found themselves working from 8:00 am to 5:30 pm on days.

The theory behind the rota was that the short evening shift would enable the operators to make the most of their days off. However, the day shift was impractical for those operators

who spent at least an hour travelling to and from the site.

To his credit, the person responsible for the system conceded that he was wrong and a more conventional version of the two shift pattern was employed.

● Pete Rushton has kindly sent me details of the shift system used at his site and I intend to use it in further discussions on shift work in this column.

By Bernard Allen

## Plain speaking

ONE of the great virtues of plain members of the operations fraternity is the direct manner in which they put their views across. Consider the following career progression: "I have worked in both systems programming and peripheral operations because of its dynamic involvement in the real world. ... They are such a moving target that I wonder why more of us don't write to you (Op Spot) tell you all about it."

And, finally, an operator's security: "At our site security is an absolute joke — it's so bad that a 10-year-old with a stick could break in."

## HINT OF THE WEEK

## Learning from past mistakes

ENDORING an Op Spot hint on the use of the hardcopy log as a means of learning more about both system and workload (Op Spot, May 10), and commenting further on the subject, DP manager R. W. writes: "We use a two-part hardcopy log. The top copy is torn out, and along with the output, returned to the programmer or operations supervisor to be filed away."

"The second copy is the historical record and can be very useful in the event of a 'disaster' striking twice. Questions such as 'How did we get out of this the first time?' and 'Which version of the program ran?' can be answered by referring to it."

By Martin Banks

## Zilog Z8000 prices are released

PRICING details are available on the two versions of the new 16-bit microprocessor introduced by Zilog.

The Z8002, which is the version designed for address up to 64K bytes of memory, costs £100 each. It has been available in quantities since the early part of March this year.

The Z8001, which is now expected to be available in September, will cost £130 each. This is the 48-pin version, the part which can directly address up to 8 Mbytes of memory.

In both devices the same bus chip is used, with the seven address lines and segmental trap line required for the Z8002.

The Z8001 uses a memory segmentation technique to address 8 Mbytes, and this is controlled by a memory management unit that is not expected until towards the end of this year. Zilog is, however, due to give details of the device to produce a management unit using several general purpose devices.

## Water processing equipment

TELEMETRY equipment from Yorkshire Water Authority will process water from the River Derwent for housing drinking supplies is being provided by Serck Controls at Leamington Spa which is a Serck 2D1. The master station at Barnby will system features, 64K of memory and linked to a Serck Chromimic colour plotter.

## Printers ready and waiting

PRINTERS, at slightly lower cost and quicker delivery than usual, are now available from Abacus Computers in London. The company has obtained supplies of Centronics Mini, 761, 702 and 703 systems, Texas Instruments 810s and MEC Spin-writers. Prices range from £421 for the Centronics Mini through to £2,165 for a Spinwriter with keyboard. Deliveries are between 14 and 21 days.

## Fall in price of software packages flattens out

THE cost of software for micro-computer systems continues to fall to the end user as the market for a particular program package broadens. It is, however, unlikely to fall much lower than the price being charged by Petsoft for a range of Adam Osborne programs.

An effective price of under 20 pence per program is being charged for a set of 76 financial and mathematical programs originally developed by Osborne, the American best-selling author on microcomputers and small systems software.

The set is available at £15, and the programs first appeared in Osborne's "Some common basic programs." They include mortgage amortisation, linear programming, future value of an investment, recipe cost and system reliability amongst other titles.

The set has been a year in conversion from book form to

computer displays because the switching process and colour change takes 100 milliseconds.

At Hursley, the addressing time has been reduced to four milliseconds and below using a derivative of a compound called viologen. Viologens are soluble salts and both ICI and Phillips have been working on different ones.

## Racal's in-house R&amp;D seeks outside orders

THE in-house microelectronics design and manufacturing facility established by Racal last year, with an investment of some £1.5 million, has now gone "public".

Known as Racal Microelectronic Systems, it is making the design and production service available to outside companies.

Based in Reading, the service will provide custom-designed chips either as complete large-scale integration devices, or as uncommitted logic arrays, as well as thick-film hybrid modules and complete microelectronic sub-systems.

According to managing director Keith Thrower, Racal's uncommitted logic array technology is one of the most advanced in the world.

Using silicon gate cells designed with 5 micron geometries, the company claims that parts manufactured with its ULA process have high packing density, low power consumption and fast switching speed. Design

## Expanding

PLANNED expansion has led to the Robert Horne Group, a supplier of quality papers and boards to the printing industry, installing a Univac 1100/12 system, valued at £1 million.

## CIS-Cobol for Intel launched

MORE details are now available of the Vendor Supplied Programme of software support being initiated by Intel at the NCC next month with the launch of the Micro Focus CIS-Cobol compiler (CW, May 17).

The programme is expected to grow rapidly into a wide range of software products supplied by

## NCC '79 will delve into social effects of computers



Congressman Charles Rose believes America's future is tied to computers.

IBM president John Opel will be the keynote speaker.

Charles Lecht lectures on future directions.

THE National Computer Conference, to be held in New York from June 4 to 7, demonstrates that the US computer industry is belatedly broadening its perspectives. Quite a few of the speakers at the conference will address issues that go beyond the confines of computers.

Issues such as international data flow, the social effects of computers, the future of advanced as well as less-developed nations are all central topics this year.

In the past, the emphasis of the conference was markedly different: typical speakers talked about engineering techniques or software methods. That technical side of the industry is well-represented this year, but it no longer dominates the conference.

IBM president, John Opel, will open the conference as keynote speaker. Characteristically, neither Opel nor IBM will reveal the content of the planned speech.

Later that day Dr Willis Ware, of Rand Corp, will speak about computers and society, a topic that has been the object of his work for some time.

Tuesday's featured speaker will be Charles Lecht, head of Advanced Computer Techniques. His topic is to be future directions in computing. Lecht thrives on controversy, and so do his fans — there are many — and philosophical adversaries (there are many of those, too).

On the Wednesday, Congressman Charles Rose will speak on "Computers, law and public policy". Rose, more than any other person in the US Congress, has stated that America's future is tied to the wise use of computers.

His views, which may well be translated into law, could place the government in opposition to the desires of the industry as he examines social priorities in relationship to the needs of business.

Thursday's featured address has Dr Portia Isaacson speaking on "Personal computing — is it worth it?" Dr Isaacson is deeply involved in the personal computer business as the owner of computer stores and as a speaker on personal computing topics.

Other topics to be discussed at the NCC include Edwin Spiveack's session on regulation and anti-trust control of computers and communications. George Michael will describe his experience with mass storage at the Livermore Laboratories, and Rein Turn is to hold a forum on privacy protection in transnational data systems.

At another forum, US foreign policy as it affects computer exports will be discussed under the chairmanship of Arthur Downey, and Edward Zimmerman will describe the way computers are used in the White House.

Other events include Gerald Engel's forum on teaching college students and professionals

about the ways computers affect society; James Albus's session on advanced industrial robots; Carolyn Landis' presentation on the status of women and minorities in computing; and Kasivisvanathan Vairavan's discussion on the ways computers affect developing countries.

This year's convention is the largest yet, in terms of the number of exhibits, the size of the exhibits, the number of persons who are expected to attend and the number and variety of topics that will be presented.

But for most visitors, the importance of this year's NCC will be its quality, not its quantity. Americans, forced to think in global terms by oil shortages and political surprises, are becoming acutely aware that computing and data communications will have a great bearing on the conduct of international affairs.

The US computer industry, which has looked inward in the past, is now maturing. The NCC, which has sometimes lagged rather than led the industry, appears to be maturing as well.

## ...AND NOW, MORE OF HESH WIENER'S LETTER FROM AMERICA

## Listening in to secret calls

TELEPHONE service personnel in the US — the people who answer complaints at local telephone company offices — may be subject to a little-known invasion of privacy: their telephones could be open to the ears of anyone in possession of certain secret telephone numbers.

For some time service personnel have been aware that supervisors may be listening to their business calls. This process is carried out in the interest of insuring high quality service, according to AT&T. It had been presumed, however, that this eavesdropping was confined to local managers in various AT&T offices.

It was believed, by most who had looked at the situation, that AT&T had achieved an acceptable balance between the desire for privacy on the part of employees and the need to monitor the quality of work performed by these employees.



Making fibre optics in the US.

## Fibre optics for 1980 Winter Olympics

TWO fibre optics transmission lines are being installed in New York State. One will be used in the upstate town of Lake Placid, where the 1980 Winter Olympics will be held, while the other will run from New York City through several suburban cities to White Plains.

The Lake Placid installation will be temporary, and when the media have left after the

Olympics, it will be taken down. But the New York-White Plains line will carry thousands of audio links in regular commercial service along a route that is one of the busiest communications paths in the US.

The fibre optic cable is about 2 cm in diameter, but is the equivalent of several twisted pair cables each 10 to 12 cm thick.

The 24-mile link at Lake Placid consists of 12 fibres. Six of them will handle 288 voice communications channels, two will provide television links and four will be used as back-up channels.

The White Plains line is 30 miles long, and has repeaters about every three miles. It can handle 14,000 audio channels simultaneously.

The technical roots of today's fibre optics transmission systems go back 20 years to experiments at Bell Laboratories that led to the development of the laser. In 1976 a complete light transmission system was tested in Atlanta. The New York installations are direct descendants of the Atlanta experiment.

One of the most difficult problems to be faced by the developers of the light beam systems is the provision of small reliable lasers that work at infra-red wavelengths. Infra-red light has lower losses in the glass fibres. As such infra-red lasers are developed, the cost of light transmission is expected to drop sharply and usage of the new medium will increase.

## Loans to S. Africa revealed

THE computer has taken a stand against racism. The United Nations Special Committee Against Apartheid has revealed the sources of \$5.5 billion in bank loans to South Africa, the most extensive list of its kind yet produced.

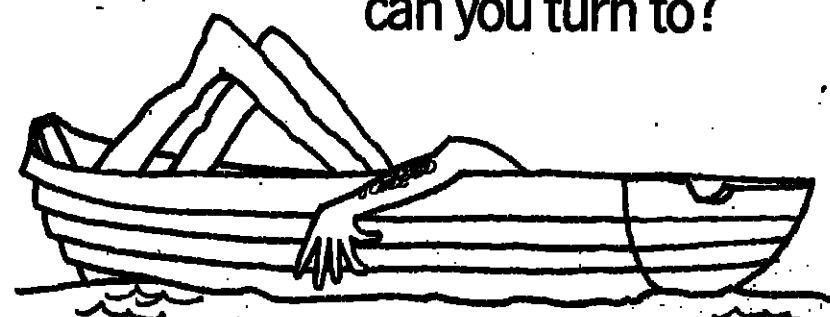
The project was completed

with the aid of computers that sorted through and analysed thousands of facts to produce a unified picture of banking activities. The work was done by Corporate Data Exchange, a New York research organisation.

The UN group apparently is

hoping that the publicity given to the banks and the governments that oversee them will eventually lead to restrictions against such loans. Ultimately, these restrictions could force the South African government to abandon policies which the UN group finds abhorrent.

When you're up the creek without a paddle, who can you turn to?



You can ride along on the crest of a wave for years keeping pace with the flood of advanced computer technology. Then, suddenly, you get a sinking feeling. The tide turns. An innovation comes along without warning and you're left high and dry. Phone Dicoll. We promise we can help.

**DICOLL**  
BASINGSTOKE  
The MicroComputer People



## PEOPLE AND EVENTS



**PENSIONER** Richard "Bumble" Wood, 88, enjoys the company of Denise Larter, a wiper with CMC of Hemel Hempstead, at a night out at the company's HQ. Bumble was one of 22 men, mainly First World War veterans, from the Royal Hospital in Chelsea who were invited to a bar

## IDPM Midlands elections

MANAGEMENT consultant Jim Russ was elected chairman of the newly-formed Midlands Regional Council of the IDPM at a meeting held at Birmingham Chamber of Commerce last week.

The main aim of the council was to set up branches of the institute in the Midlands and this is understood to be the first such attempt outside London following the merger between the IDP and the IDPM.

Other officers elected were: Peter Craig, vice-chairman; Colin Bailey,

secretary; David Cox, treasurer; Harry Holman, membership secretary; Paul Thompson, publicity; and Dave Close, education. The following were elected to serve on the council's committee — Peter Birley, T. Bofonds, Peter Craig, Roger Dowle, Karen and Steve Hazeldine, Colin Marples, Mike Thornton, Ken Wagstaff and Chris Youett.

The next meeting will be at Metro House, Hagley Road, Birmingham on Tuesday, June 12. It starts at 7.00 pm.

## UCSL reorganises sales and marketing

THE subsidiary of Unilever, UCSL Microsystems, has announced the appointments of specialists in its sales and programming divisions, and also a reorganisation following the acquisition of Penions and Insurance Computer Services (PICS).

Kelvin Moon has become account manager in the sales team at UCSL. He joined the company from Data Recognition where he was a salesman. Mike Williams has also been appointed to this position. He has worked for UCSL since 1970, and has been in Lusaka, where he worked a two-year contract with ICT Central Africa, designing systems for the Zambian Ministry of Finance.

Assistant development manager responsible for special customer designed software is Margaret Powell. She will head a team of microprocessor programming experts responsible for the design of programs for the M45 and M50 data entry

terminals. Prior to this appointment, Powell was head of computer and mathematical services for the Fire Research Station.

Carle Bedford, who used to work for an export agency in Manchester, has become marketing assistant for UCSL. She joined the company as secretary to the general manager, Bob Gilkes.

PICS, which was acquired last year, is taking over the business for the pension and insurance sectors being handled by other UCSL divisions.

As part of the reorganisation, Geoff Humphrey takes up the position of industry consultant within UCSL, with responsibility for consultancy and for identification of the market requirements.

Mike Judd will direct the reorganised PICS, and the new address is 5 St John's Lane, London EC1. Tel: 01-250 0812.

## Control Data appointments

The data services division of Control Data has announced a number of new appointments.

Team leader in the South is David Withey, a former senior salesman with the company. Len Greenwood has transferred to this division from Control Data where he has been a support analyst.

Several new appointments include that of Graham Kimberley from Cable and Wireless, Peter Furness from Marconi Research, Richard Galpin from Merck, Sharp and Dohme and Alan Derby an ex-freelance programmer. All join as sales people for the South.

In the North, the new appointments include that of John Gelder, who is from Burroughs, Nigel Seed from John Thompson Engineering, Maureen Garwood, a former accountant with Sharples Photomechanics and Robert Allin, from White, Young and Partners.

Ian Bacon, a former consultant with Gemini Computer Systems, has become manager of the recently opened office for Information Processing People, IPP (Northern).

Mike Davies has been appointed managing director of Wescode Equipment. He is a former management consultant specialising in international marketing and general management.

Don Dehard has joined Versatec as UK sales service manager. He was formerly with Computer Technology before becoming hardware project manager for Versatec.

Eddy Dalton has been appointed managing director of the new company, Wright Air Conditioning (Northern), which has been established at Leeds. A former Northern sales manager, Duncan Smith, has become sales director of the company, which forms the sixth service member of the Wright Air Conditioning network.



Moon Eggman

Amand Shariff, manager of Burroughs large accounts marketing South London branch, is joining the company's international group at the Detroit headquarters. He is to be product manager for large systems. The new manager of the south London branch will be Peter MacLeod, who is currently Burroughs communication systems' promotion manager in the UK.

## Vice president of FEACO

THE Management Consultants Association has announced the appointment of Cyril Brown as vice president of the Federation Européenne des Associations de Conseils en Organisation (FEACO). Brown is managing director of Annan Impey Morris, a management consultancy firm, and was chairman of the Management Consultants Association in 1978.

## DIARY

**JUNE 4** DEC 4000 series Fortran systems, W.D. Manville, BCS Fortran specialist group, BCS HQ, 13 Mansfield Street, London W1. 10.30.

**JUNE 8** Weekly wages by direct credit, BCS, City University, London EC1. Contact Christine Cox, BCS on 01-637 0471.

**JUNE 7** Computer interpretation of hand printed Fortran programs, M. Brady, Nuclear Physics, lecture theatre, Keeble Road, Oxford, 10.30.

AGM and wine and cheese, BCS Merseyside branch, Liverpool University Abercromby Square, Liverpool, 18.00.

**JUNE 11** Finding finance for the small business, CAET, Drury Lane Hotel, Drury Lane, London WC1.

**JUNE 11-13** Technical study in legal information retrieval in Europe — symposium on results of the study, European commission, and Council of Europe, Council of Europe, Palais de l'Europe, Avenue de l'Europe, Strasbourg, France.

**JUNE 14** Structured Programming, North East London Polytechnic, Haringey, London. Details 01-509 5141, ext. 48.

Simplicity and approximation in sequential pattern identification, B. Gaines, Oxford University, Keeble Road, Oxford, 16.00.

**JUNE 18** World fertility survey: technical problems of international research and AGM Study group on computers in survey analysis, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1. 17.30.

**JUNE 21** Pattern recognition and automation, J. Weaver, Oxford University, Nuclear Physics lecture theatre, Keeble Road, Oxford, 10.30.

**JUNE 20-22** ITCS-8, the ninth annual international conference on fault-tolerant computing, IEEE Computer Society, 2121 Wilmslow, Contact IEEE Computer Society, 6955 Naples Place, San Francisco, CA 94063.

**JUNE 25-27** 16th design automation conference, IEEE Computer Society, San Francisco, California.

**JUNE 27** Introduction to database, North East London Polytechnic, Haringey, London. Details 01-509 5141, ext. 48.

Datamanager, MSP, 71 Gloucester Place, London W1. 10.30.

## Award for chip TV programme

The BBC Television Home programme, "Now the chips are down," which examined the role and impact of microprocessors, has won an award from Goldwyn, who wrote the programme.

Goldwyn receives £1,500 as winner of the General Category of the 1978 Technology Writers Awards. These are sponsored by ITT Business Systems and the auspices of the Association of British Science Writers.

The awards were presented yesterday at a reception at the Savoy Hotel by Lord Hames-Bankole.

Barry Thompson has joined OEM sales division of Protea, previously manager of the home division of Perseus, and is Eggman, formerly an electronic engineer with Borel in Switzerland, has been made responsible for Protea computers in South Africa.

Manfred Amand has been appointed managing director of Data Recording German sales, based in Munich. He will be responsible for controlling DIRECT and service operations in Germany and Austria. Previously he held similar positions in computer marketing with AEG-Telefunken in Intel.

## THE 3200 ERA HAS ARRIVED



Perkin-Elmer opens the next chapter in computing history. With the introduction of the Model 3220 — first processor in the new Series 3200 — the second generation of SUPERMINIS makes its historic UK debut.

## Highest Performance

Perkin-Elmer introduced the world's first 32-bit SUPERMINI in 1973. Now, with a background of over six years practical experience from more than 2000 installed systems worldwide, the second generation Series 3200 arrives as other manufacturers are just launching their first.

The Model 3220 has full 32-bit architecture, a data transfer rate of 8Mb/sec, MOS memory in 256Kb modules up to an ultimate 4Mb, memory error logging down to chip level, cache memory and 128 32-bit registers.

## Lowest Cost

With all these features and many more, the Model 3220 costs less than many currently available 16-bit systems, a major cost breakthrough. For the first time, this brings within economic reach of a wide range of users the speed, accuracy, power and I/O handling capacity normally associated with 'mainframe' computers.

## Mature Software

To match the most advanced hardware, Perkin-Elmer 32-bit software has been refined and proven where it counts — in the field. This powerful software includes OS/32, a real-time, multi-tasking operating system, together with a host of language processors and utilities, including COBOL, globally optimising FORTRAN

VII, BASIC, CORAL66, ITC transaction monitor and OS/MTM for multi-terminal program development facilities.

## The 3200 Team

Perkin-Elmer, a Fortune 500 company, is world-renowned as a major manufacturer of high-technology optical, instrumentation and data processing products. The Model 3220 SUPERMINI is the latest evolution in the company's commitment to industry leadership and innovation. It is backed by years of field experience, fully-proven software and a team of dedicated professionals committed to making your installation a success.

Find out how the 3200 Team can help you. Return the coupon or call Jane Berry on Slough (0753) 34511.

**PERKIN-ELMER**  
Computer Systems Division  
227 Bath Road Slough Berks Tel: Slough 34511  
The new big name in computers.

I am interested in the Model 3220. Please let me have full information.  
Name \_\_\_\_\_ Position \_\_\_\_\_  
Company \_\_\_\_\_ Telephone No. \_\_\_\_\_  
Address \_\_\_\_\_

## Euro IFIP 79

London 25-28 September 1979  
The European Conference on Applied Information Technology  
A FOUR DAY CONFERENCE AND MAJOR EXHIBITION



Following the success of the 1978 IFIP congress in Toronto, Euro IFIP '79 will be Europe's most comprehensive computer conference.

More than 100 presentations from key experts and world renowned authorities. Some of the speakers are pictured above.

The conference will examine research and development, practical experiences and current problems in information technology.

1000 senior computer scientists and information systems users are expected to participate.

Plan on being there. Send for your conference brochure now.

Name \_\_\_\_\_  
Organisation \_\_\_\_\_  
Address \_\_\_\_\_  
Phone \_\_\_\_\_

Euro IFIP 79, Box 46,  
Cleveland Road, Uxbridge,  
Middlesex, England UB8 3UD  
Telephone: Uxbridge 31118, England  
Telex: 261178

CW

## L'Espresso File

by Dan

D'YOU LIKE MY ENGAGEMENT RING?



OH, VERY TRENDY! IS YOUR FIANCÉE A COMPUTER PERSON?



YES, HOW DO YOU KNOW?



A SILICON-ON-SAPPHIRE RING!



## cheap needn't mean nasty

With the new ADPS Regent 20



- The fraction, reliable VDU big in standard features but low in price because:
- The Regent 20 has full upper and lower case
- The Regent 20 has 256 and compact loop interfaces
- The Regent 20 has which selectable output presentation
- The Regent 20 has which selectable output character sets
- The Regent 20 has printer interface
- The Regent 20 has line monitor mode
- The Regent 20 has anti-glare screen

Now compare the price and you'll see the needn't be nasty and mean.

Terminal Display Systems Ltd  
Whitworth Industrial Estate  
Blackburn  
Lancashire  
Tel: (0534) 82222  
Telex: 9338 1774



## TIM PALMER ON THE COMECON COMPUTER SCENE

## Do-it-yourself service is the Robotron rule

BECAUSE of the great distances between major centres in the Socialist countries, and the comparatively small population of mainframe computers, it is uneconomic for the supplier to try to provide a round-the-clock maintenance service. Do-it-yourself maintenance is therefore the rule for customers of VEB Kombinat Robotron, the East German enterprise which builds the most powerful computers in volume production in the

Comecon countries' Rjad unified range.

These mainframes are the ES-1040, which Control Data rates as comparable in power to the 370/145, although it is more like a large 380, and the ES-1055. The specification of the 1055 makes it a little more powerful than the 370/148, 0.45 mips compared with 0.43 for the 148, but Robotron plans to expand maximum main memory to four Megabytes, bringing it closer to the 370/158.

First delivered in 1974, the ES-1040 is the most successful mainframe in the Rjad line, with well over 200 installed, and between 40 and 50 to be built this year, as well as 11 ES-1055s.

Instead of providing maintenance to customers, Robotron trains the customer's own engineers, and the largest training centre is in Leipzig, where a teaching staff of 200 educate 2,000 students a year.

Since Robotron has installations or customers in all the Socialist countries, as well as Iraq, India, Cuba, Yugoslavia, Mongolia, North Korea — and Control Data in the US — the majority of the students going through the training school are foreign. Where it is necessary to give a course in a foreign language, interpreters generally have to be used, but the number of courses available in Russian and English is growing.

Robotron provides hardware and software courses at Leipzig, and also trains operators. For a mainframe installation, 10 operators and seven maintenance engineers are usually trained — and the students are put forward by the customer.

However, a minimum education standard is required, and preliminary tests are given. If students put forward prove unsuitable, the customer has to bear the cost.

## 765 Portable Bubble Memory Terminal

A fully portable terminal with non-volatile bubble memory that retains data even without power. The 765 has a full ASCII keyboard, virtually silent electronic printing and true 30-cps capability. The powerful command mode uses common English terms and the editing feature provides a simple yet powerful means of correcting and adding data on the spot. The 765 can go wherever you go, cutting costs by letting you batch transmit to your host at cheap call rates.

## 745 Portable Terminal

The 745 weighs just over 13 lbs — giving you real briefcase portability, yet offering you true 30-cps throughput, incoming data buffering and virtually silent printing. Built in acoustic coupler is standard, with optional auxiliary EIA interface and APL keyboard.

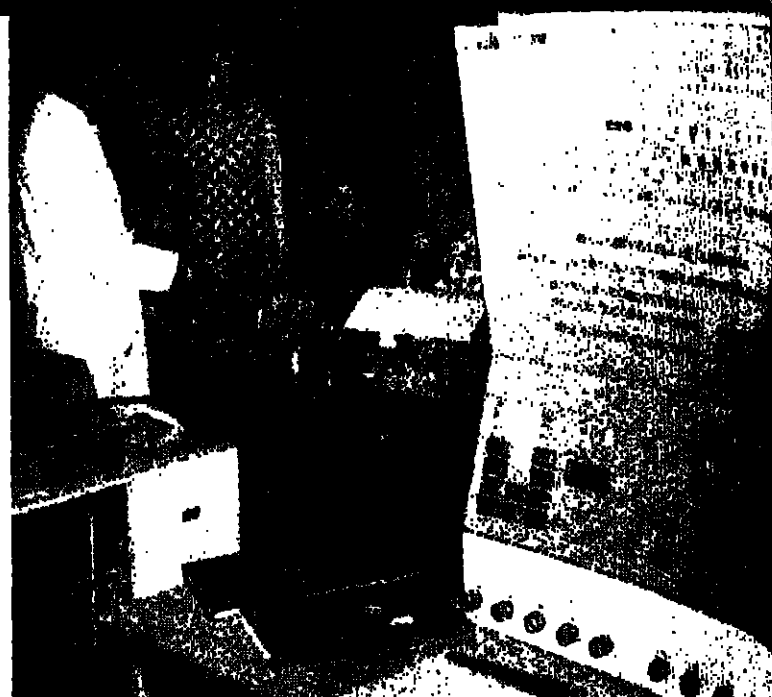
For full details, sign your letterhead, clip it to this advertisement and post them to us now.

Texas Instruments Ltd, Supply Division MS21,  
Manton Lane, Bedford MK41 7PA.  
Tel: Bedford (0234) 67466, Telex: 821778.

Sales Offices: Bedford (0234) 67466 Extn. 3718.  
Edinburgh (031) 229 5571. Manchester (061) 432 0645. Slough (0753) 33411.

**TEXAS INSTRUMENTS**  
LIMITED

Students undergo instruction in Robotron's training centre in Leipzig. "It makes a welcome change to get a girl on one of the courses," commented Helmut Steinhoff, Anlagen-techniker at the school. In the foreground is the console of a Russian-built ES-1022 computer.



In a planned economy, each sector is given a centrally-decided priority, and that given to computers in the Comecon countries is such that there is a shortage of computer hardware.

At the training school Robotron has one fully configured ES-1040 system, and a 1055 CPU which is being configured with peripherals and can be linked to the 1040 in a multiprocessor configuration. A second 1040 processor is dedicated to training CPU specialists, and there is a third 1040 CPU for training in online techniques and diagnosis.

There is also an ES-1022, and an old R21, which is ES-compatible, runs under the DOS/ES operating system, but having been built in 1971, pre-dates the Unified Range.

The shortage of hardware makes it tough for the students. "Hardware is our biggest investment," says Helmut Steinhoff, head of hardware technology at the school, "and we have to get maximum use out of it. Practical courses are run in three shifts, which makes it hard for the students who go on at midnight. But although they cannot perform at their

best, we have been doing for years and it works, so we keep it that way."

Software courses run for weeks, hardware courses for weeks, and there are an average of 24 students per course.

As well as getting maintenance engineers, the customer gets a stock of spares, and take additional spares in a standard complement of wishes. If a problem proves tractable, Robotron engineers are available to give assistance, and the Kombinat has a total of 1,000, covering mainframe office computers.

## Videoton sales to West soar

AFTER a slow start, sales of Videoton computer equipment and services to the West are beginning to soar, and the company has scored some solid successes in West Germany where it began its market thrust. Videoton is planning to sell \$180 million of computer equipment this year, up to 125% from 1977, and 80% is exported, mainly to other Comecon countries. But Western business, accounting for \$100 million in 1977, grew fivefold last year and for 1978, Videoton has secured contracts worth \$100 million already.

Unlike its East German counterpart Robotron, Videoton does to license Western technology as a springboard into the

computer business, and has forged a close and successful relationship with the minicomputer division of CII, and its successor SEMS.

As a result, Videoton is able to offer its customers as up-to-date a minicomputer as any available, and at Hanover showed its own version of the new SEMS Mitra 225 a few days before it was announced in France.

"We are very careful not to do anything to bring us into conflict with SEMS," says Dr Csaba Barath, exhibitions manager with Videoton. This effectively precludes straight minicomputer sales in the West, but allows Videoton to offer systems packaged with software for a particular application.

The two current Videoton minicomputers are the single-board VT 60, and the new VT 600, which comes on two boards and uses the Motorola 6800 micro in the peripherals controllers.

On the way is a version built using the AMD 2901 bit-slice micro which will appear as the VT 800.

Half of Videoton's computer business is minis, including products like the Videodisc simple, low-cost key-to-disc system. Based on the VT 60, it supports 16 keystrokes, which are little more than adapted Videoton TV monitors, which helps to reduce costs. As well as being sold in the Comecon countries, these have

found favour in Yugoslavia. Videoton is still looking for Western European partners marketing minicomputers, terms such as the Videoton.

Working closely with SEMS, Videoton has contributed software development on the operating system, and modernising the Cobol compiler. It is also developing Basic machine and working on a sharing subsystem.

In the Rjad unified range of compatible computers, throughout the Socialist countries, Videoton offers the ES-1011, which is based on the 6800.

A larger, 370/115-like machine, the ES-1013, which is not based on SEMS license, will go on show in Moscow for the first time next month.

The VT 2000 series of desktop terminals is built around Intel 8080, and are marketed throughout Europe by Videoton and also sells the VT 600 in Finland and Algeria.

Videoton has sold 10,000 play terminals so far, and built 4,000 this year. The other component of the company's computer business is OEM peripherals, which has been sold from Dataproducts, and printers and other peripherals make up the remaining 20% of the company's



IN its second year of marketing computer products in Western Europe, Poland is now offering the Mera 100 office computer, shown here. The 8-bit processor, built in TTL, is surprisingly portable, not a microprocessor. It comes with 8K to 64K-bytes of main memory, and is programmed in proprietary assembler, and comes with two floppy discs, full width printer, both built under license from Logabex of France, and a Burroughs plasma display. There is

also a tape cassette unit of Mera's own design, and the plasma display can be replaced by a CRT.

Software available includes a range of accounting packages and a text processing package, and the system is currently sold by Videoton in West Germany and Holland.

Mera is also offering a modular CAMAC Computer Aided Measurement And Control system based on the Intel 8080 and built around the new standard ACB bus.

## Micro network to mimic 'foremen'

A NETWORK of micros designed to mimic the human organisation of a group of factories is being developed by Robin Woods, technical director of Iser-Woods, microprocessor specialists, of Luton, Beds.

Given the unlikely name of Mercator's Projection, Woods' system uses groups of Commodore Pets as "foremen" to supervise up to 20 Texas Instruments PM550 process controllers to monitor laboratory instruments.

The Pets report to a factory level supervisor in the form of a cluster of two or three close-coupled minis. These would be Digital Equipment or Data General machines, or possibly Texas Instruments 9800s or DXS data exchange systems. Woods, an ex-Texas man, is familiar with the units.

The minis would share 50

Mbytes of disc store and each processor would specialise in different tasks such as processing for various levels of management or polling to find messages or files to be passed on.

Typically, three factory level clusters report to a similar division level cluster. This would have 1 Gbyte of disc store and handle communications between the network and the mainframe, selecting the appropriate path according to the type of link, for example, for transaction or batch processing.

Potential customers have IBM and Honeywell mainframes and Woods expects to have the Pets emulate IBM 2280 or 3270 display terminals for upward communication.

Typical systems would have about 90 Pets controlling 600

PM550s, with three factory level and one division level supervisor clusters. This could cost in the region of £1.5 million, depending on the interfaces. At factory machine level the interfaces would replace relay and analogue loop interlocks.

Woods says he is taking on people now to work on the project and thinks he is six to nine months away from his first orders.

## Univac to 'buy in' advanced technology

WITH its research and development investment planned to be \$167 million this year, up \$9 million from last year, Univac has stated that a major part of this will be spent in acquiring advanced technologies such as Gallium Arsenide (GaAs) semiconductors, voice input/output systems, and Josephson Junction circuits.

As highlighted at a Univac seminar in Paris earlier this month, many of the technologies are a long way off, but in some areas, results are already being seen.

As previously reported (CW, May 17), Barry Borgerson, director of research and technical planning at Blue Bell, Pennsylvania, has predicted that Emitter Coupled Logic technology will give way to GaAs techniques within a decade on the company's top-end machine.

But the difficulties in manufacturing GaAs materials is such that Borgerson indicated that Univac would probably take the short route and buy in the technology from Rockwell International, a company he believes is doing good work on it.

To make the best use of new semiconductor materials, however, Univac is attempting to develop new wafer lithography techniques as well — particularly X-Ray and Electron Beam lithography.

With electron beam etching

"we have already achieved sub-micron widths," said Borgerson. "We are hoping for one-tenth of a micron eventually. Our biggest problem is particle scattering which makes it impossible to etch a line the exact width of the beam you are using. You have to make allowances for this."

Already providing commercial income, a voice response unit, called the VRU-104, has been sold to the West German mail-order company Otto Versand. Seven will soon be installed and a further three by the end of the year.

The VRU-104 is accessed by phone lines, and customers input order information not vocally, but via a touch-tone keypad. This keypad converts electrical signals into audio tones to which the system is programmed to respond.

The nature of the response depends on what routine is being used, but all output from the VRU-104 is composed of digitised human speech held in memory, not of artificially synthesised sounds.

Regarding speech recognition, experiments are going ahead on a linguistic pattern-matching technique that will be able to accept both single words and sentences from a number of speakers. On the company's present prototype, an estimated recognition accuracy of 90% has been claimed.

## IDPM tidies up merger

AT an emergency meeting of the Institute of Data Processing Management last week, members were divided as to whether the secretary-general should be elected by the rank-and-file or appointed by the Institute's council.

Held in the Bloomsbury Centre Hotel, London, the present secretary-general, Ted Cluff, argued that the holder of his office should be elected by the

full voting membership. This viewpoint won the day.

The meeting had been called to tie up constitutional loose ends arising from the merger of the former DPMA and the IDP.

The rule changes agreed now mean that the council can elect honorary fellows, subscriptions are payable on the anniversary of a member's election, that changes in subscriptions can only be made at AGMs.

## Amateurs' 360 may prove to be white elephant

SOUTHAMPTON Amateur Computer Club has been offered an IBM 360, but this could be more of a liability than an asset, as club president, Paul Maddison, admits that the club could not raise the money necessary to maintain it by itself.

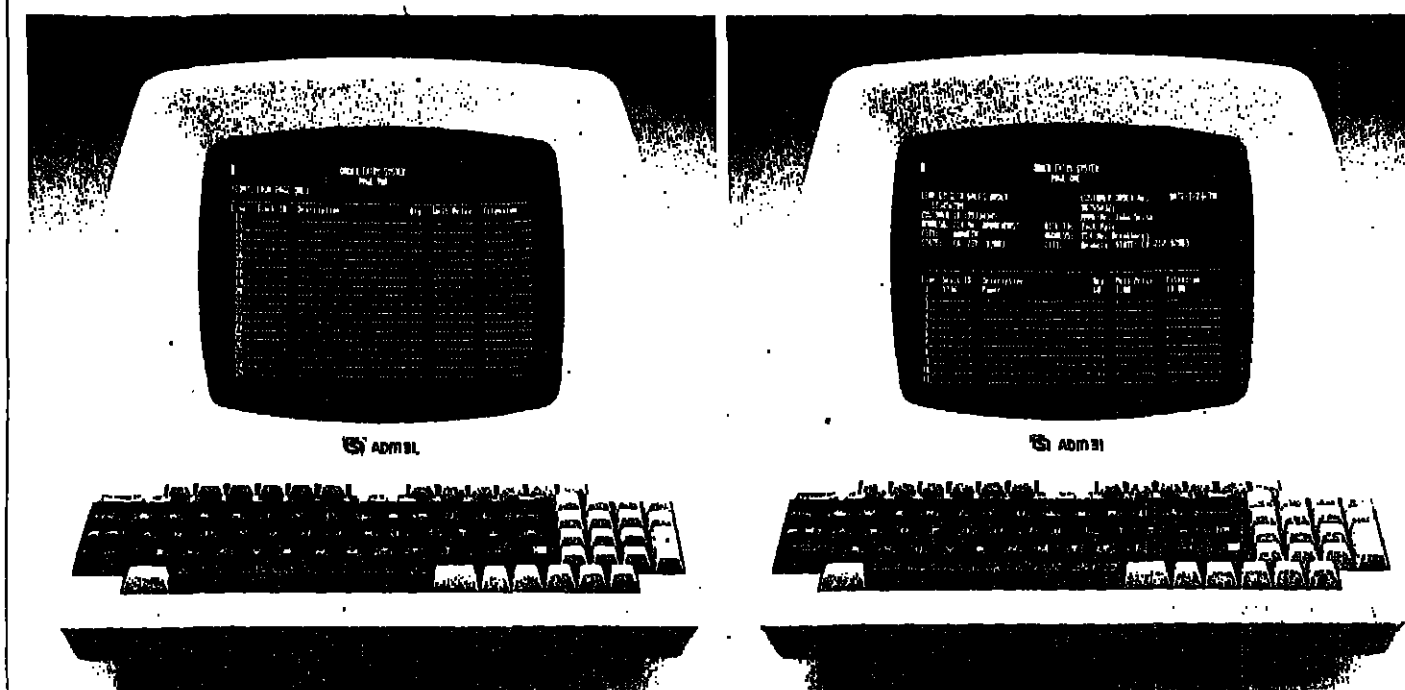
The system could be worth several thousand pounds, but unless the club finds a sponsor with premises and backing of up to £5,000 a year it will be unable to take up the offer.

The club started three years ago as part of the Southampton University students' union, and split off last year to enable outsiders to join. Its 120 members meet at the university on the first Wednesday of each month, except for the summer break from July to September. It invites

outside speakers from the micro industry, such as Paul Greenhalgh and Howard Birkett from Nascom who spoke at the last meeting.

Microcomputers owned by the members include three homebrew Z80 systems, three Nascoms, a Pet, a MK14 and a 6800 based homebrew system, but there has not been much activity in specialist groups based on each micro.

Encouragement for the big machine venture has come from the Galdor Centre in Surbiton, Surrey, which was started five years ago when four students bought an ICL 1301 for £200 in order to learn about computers. It now has two 1905Fs and a 1904E and runs overload work from other bureaux.



## Buy the first page, get the second one free.

Our new smart terminal, the ADM-31, features a full two-page display as standard equipment. Not as an option. And its low cost and high reliability tell you it was made by those same people who make the world-famous Dumb Terminal™. But the 31's similarity to the Dumb Terminal ends with its dependability and rugged, proven case.

**THE ADM-31 IS ALL KEYS UP.** The ADM-31's 81-key solid-state keyboard is integrated with the main logic, and can generate all 128 ASCII characters. And it features an integral numeric key pad, with period, comma, tab, minus and numerals. All arranged in a familiar calculator format.

**THE ADM-31 PROVES DUMB IS ONLY SKIN DEEP.** The ADM-31 is completely self-contained, with full editing, formatting and protected fields capabilities. And equipped with keyboard, control logic, character generator, refresh memory, and interface. Not to mention a microprocessor which increases reliability and ease of use. You can even order it with a printer port option, and get printouts along with your readouts.

And the 31's behaviour modification gives you a factory installed personality for an alternate ESC sequence lead-in — in addition to the

standard ESC, And End Block character. A New Line character sequence. A field separator. And even a function sequence preamble.

**THE ADM-31 IS ALL KEYS UP.** The ADM-31's 81-key solid-state keyboard is integrated with the main logic, and can generate all 128 ASCII characters. And it features an integral numeric key pad, with period, comma, tab, minus and numerals. All arranged in a familiar calculator format.

The ADM-31 comes complete with character insert/delete, line insert/delete, erase to end of line/field/screen, back tab, and six send sequences. All standard equipment.

And the Standard Edit option lets the ADM-31 clear to protected spaces, clear to unprotected nulls, and set and reset copy/print.

As if that isn't enough, the keyboard includes a caps lock key (to lock the keyboard into upper case only).

## THE SMART CHOICE FOR A SMART TERMINAL.

After all this, you're probably thinking the ADM-31 is one of the smartest ideas to come along in quite a while. We'd have to agree.

So if you're in the market for a new, smart display terminal, consider ours. Then call Lear Siegler, or contact your local distributor. We'll be glad to tell you all about our new ADM-31.

A terminal far too smart to be considered dumb.

The ADM-31 is just part of the new Lear Siegler range of high technology computer products.

Contact us or your local distributor for full details.

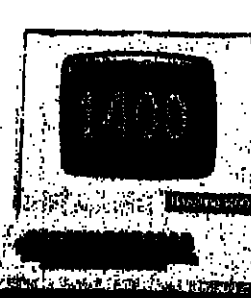
**ADM 31** **LSI**  
Two pages are better than one

**Lear Siegler Data Products Limited** Orchard House, Connaught Road, Brookwood, Surrey, UK. Tel: 04887 80566

**LEAR SIEGLER AUTOMATION DISTRIBUTORS:**  
Australia: Merit Automation Pty. Ltd. Tel: 0222-222405. Finland: Jorac Oy. Tel: 050 585133. Denmark: Glyndend Copenhagen. Tel: 45-1 547162. Norway: S. Marjane Coppenhagen. Tel: 45-1 262294. France: Technology Resources. Tel: 33-1 747 7011. Benelux: Compulink BV. Tel: 45-1 547162. Ireland: Data Processing Ltd. Tel: 001-789168. Israel: Information Systems Ltd. Tel: 02-3 224 74. Italy: S. Marjane Coppenhagen. Tel: 02-262294. Japan: K. S. Marjane Coppenhagen. Tel: 03-3 224 74. South Africa: S. Marjane Coppenhagen. Tel: 021-45-2314. Spain: S. Marjane Coppenhagen. Tel: 34-1 403 03 82. Sweden: Datacom. Tel: 45-760 51635. Switzerland: R. Marjane Coppenhagen. Tel: 41-1-62-32-11. West Germany: TDC Data Communications GmbH. Tel: 49-6108 48140. United Kingdom: S. Marjane Coppenhagen. Tel: 04887 80566. USA: S. Marjane Coppenhagen. Tel: 0794 791384. Penny & Giles Data Recorders Ltd. Tel: 0452 58 7151. Peripheral Hardware Ltd. Tel: 01-491 4200.

## Hazeltine

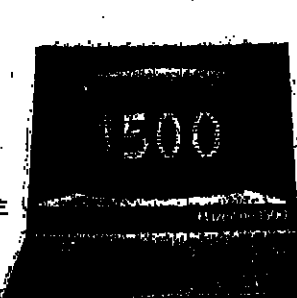
*Just Right*  
**Terminals**



**H1400**  
... for data enquiry and data entry applications.  
**LOW COST HIGHLY RELIABLE**  
Features include:  
• 24x80 Screen Configuration  
• 16 Displayable characters  
• Cursor addressing and scrolling  
• Remote Commands



**H1410**  
... for numeric data entry applications.  
**1400 ECONOMY 1500 STYLE**  
Features include:  
• Separate numeric pad  
• Self test feature (also 1400)  
• Enhanced cosmetics  
• Plus all the 1400 features



**H1500**  
... for enhanced screen processing and FULL-SCREEN CONVERSION.  
Features include:  
• Upper and Lower case  
• Dual internal screen  
• Right margin control  
• Plus all the 1400 features



**H1510**  
... for buffered screen formatting applications.  
**PROTECTED FIELDS LOCAL EDITING**  
Features include:  
• Textual, Page, Line, or batch  
• Select Function Key Mode  
• Cursor control keys  
• Plus all the 1500 features



**H1520**  
... for typed with printing requirement sharing & communication line.  
**INDEPENDENT CONTROL PRODUCTIVITY**  
Features include:  
• Serial and parallel printer interfaces  
• Independent printer  
• Independent printer speeds  
• Local or on-line printing  
• Plus all the 1500 features



**H1520**  
... for typed with printing requirement sharing & communication line.  
**INDEPENDENT CONTROL PRODUCTIVITY**  
Features include:  
• Serial and parallel printer interfaces  
• Independent printer  
• Independent printer speeds  
• Local or on-line printing  
• Plus all the 1500 features

I am interested in model(s) 1400 □  
1410 □ 1500 □ 1510 □ 1520 □  
Please send literature □  
arrange sales visit □  
Name \_\_\_\_\_  
Position \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
Tel No \_\_\_\_\_  
to Hazeltine or your local distributor

**Hazeltine**  
Hazeltine Limited, Terminal House, 14 Palmerston Road, Brookwood, Surrey TW20 5BA. Tel: 01-491 4311. Telex: 64822







## MARKETVIEW

BY FRED LAMOND

In March, IBM announced its new 1750 telephone switching system, a smaller and much cheaper version of the 3750 that it has sold in Europe since 1974. First customer installations, apart from pilot sites, in the first quarter 1980 will coincide with the general release (after PO trials) of the competing GEC SL-1, Plessey PDX and ITT Unimat stored program controlled private automatic branch exchange announced last year, as well as of the Post Office's own CDS5.

How significant are these new electronic PABXs? Do they just perform traditional telephone switching functions faster and more cheaply? Or are they an important step towards the much talked-about "automated office", in which telecommunications converge with data processing?

In this Marketview Fred Lamond examines these questions and the relevant differences between the various manufacturers' new models.

THE functions offered on most stored program controlled private automatic branch telephone exchanges fall into three groups:

1. Traditional telephone line switching such as that handled by electro-mechanical exchanges.

2. Advanced telephone switching and monitoring functions which are not available on older systems but are still within the voice telephone switching domain.

3. Data collection, processing and file inquiry and update facilities. They bring some of the new PABXs closer to data and word processing.

The telephone switching functions are those that private telephone exchanges, both manual and automatic, like their bigger brothers in the public networks, have performed since telephones first appeared at the end of the last century.

The new all-electronic PABXs that have appeared on the Continent in the last three years, and are now appearing also in greater numbers in the UK, use either of two alternative switching technologies for these traditional functions.

Space division exchanges connect all incoming and outgoing external and internal lines to a three-dimensional matrix of

electronic flip-flop gates, through which the stored program controller then sets up discrete paths between any calling line and the line that it is calling.

As each such live connection path does not intersect with any other live connection path on its way, the voice signals can remain AC analogue in the 300 to 3,000 Hz range throughout their path, as they do in Strowger and crossbar exchanges.

The IBM 3750 and the new 1750, ITT Unimat sold by STC, and, on the Continent, Ericsson PE, Philips EBX, and Siemens EMS PABXs are all space division systems.

The alternative technique is time division, and exchanges using this work on a completely different principle which is derived from the TD multiplexers used on pulse code modulation trunks in the public telephone network.

Each live voice line is sampled 8,000 times per second on entering the switch by a codec (coder-decoder), which turns the sampled tone into one of 256 predefined 8-bit codes, the result being a 64K bit stream. This is multiplexed with other bit streams from other active connections on a common system bus, which it leaves again on

reaching its destination output gate. Here another codec remodulates its signals back into analogue form.

Time division is regarded as the telephone switching technology of the future because it is simpler, and therefore both cheaper to manufacture and easier to maintain, more compact with savings in floor space and power consumption. The British Post Office's new CDS5, GEC SL-1, Plessey PDX, and, in France, CIT-Alcatel Cledis and Telic 25.0x series, are all TD PABXs.

These differences in switching technology do not affect the ability of either type of exchange to offer more advanced telephone switching functions than the older Strowger and crossbar exchanges. This results from the fact that they are controlled by a stored program computer, rather than by the hardwired control logic of the older semi-electronic crossbar exchanges.

Stored program flexibility allows SPC PABXs to offer a host of more advanced functions such as dialling codes for frequently used numbers, both for the PABX as a whole and for extensions; teleconferencing facilities; automatic rerouting of incoming calls to a different extension on a temporary or permanent basis; "holding" for the first free extension out of a predefined group; camp facilities on busy extensions, with automatic call-back when they are free; programmed restriction of the extensions entitled to call senior executives or long distance or international outside lines directly and there are many other facilities on offer.

The SPC PABX can log the chargeable outside calls initiated from each extension and output such information in print or on a diskette.

All the new competing SPC exchanges support essentially the same range of advanced telephone switching and monitoring functions, though they differ in the expandability (Table 1).

Since these valuable advanced switching and monitoring functions result from the use of stored program control, rather than any particular switching technique, it ought to be possible to add them with SPC to existing installed crossbar PABXs, rather than take the equipment out entirely and replace it with an all-electronic system.

Another way of preserving existing investment in old electro-mechanical PABXs is to put the required stored program functions in each extension handset, instead of in the central switching system. This is what Nixdorf has done on the 8811 Datalat. An Intel 8080-controlled telephone handset combines advanced telephone switching functions with a variety of optional data entry and output modules.

The 8811 is available to West German PABX users, but has not been type-approved by other post offices. Nor is it likely to be in the UK, as long as the British PO maintains its insistence on a rigid separation between voice telephone handsets (which must be maintained by PO engineers, even when they are connected to a PABX) and data terminals (maintained by manufacturers).

The combination of data collection and file inquiry facilities with voice telephony on a common handset as in the Nixdorf 8811 is an example of convergence between voice and

## Automated phone techniques show flexibility

telecommunications and DP.

IBM offers similar facilities on the large 3750 switching system that it has sold since 1974, and its new 1750 announced in March (CW, March 22) but in a manner acceptable to the British PO.

The telephone handsets connected to the 1750 and 3750 are conventional rotary dial or pushbutton multi-frequency handsets identical to those now offered by the PO to all subscribers, and thus easily maintainable by PO engineers.

But multi-frequency handset keys can also be used to send data entry and/or file inquiry coded signals to a computer connected to the 1750 or 3750, after the 1750 or 3750 switch has first set up a switched connection to its users.

So far, the 1750 and 3750 are still unique on the European market in the range of converging facilities that they offer.

In West Germany, Telefon and Normalbau, the telephone manufacturing arm of the AEG-Telefunken group, offers an optional data collection computer, the TENOdat 5000 or 7000, for interfacing to its TN-6030 TD PABX systems. Nixdorf offers the 8811 Datalat integrated voice and data terminal.

All other European telecommunications equipment manufacturers restrict their latest SPC PABXs to traditional and advanced voice telephone switching functions (Table 1).

not yet offer the software for this to its users.

So far, the 1750 and 3750 are still unique on the European market in the range of converging facilities that they offer.

In West Germany, Telefon and Normalbau, the telephone manufacturing arm of the AEG-Telefunken group, offers an optional data collection computer, the TENOdat 5000 or 7000, for interfacing to its TN-6030 TD PABX systems. Nixdorf offers the 8811 Datalat integrated voice and data terminal.

All other European telecommunications equipment manufacturers restrict their latest SPC PABXs to traditional and advanced voice telephone switching functions (Table 1).

direct computer file inquiry facilities from ordinary telephone handsets are unquestionably useful features, however, in any office equipped with its own computer system. Yet only two West German manufacturers have made provision for it, apart from IBM, and their systems are not currently available outside West Germany.

The British and French manufacturers of time division PABXs have not even taken advantage of their switching method to give terminals with direct access to the system bus, on which data throughput of up to 64K bps could be obtained on the same time-slot as ordinary voice line.

|                                  | Technology | Traditional switching |             | Advanced functions         |                   |                  |                   |                        |                 | Converging functions |                     |
|----------------------------------|------------|-----------------------|-------------|----------------------------|-------------------|------------------|-------------------|------------------------|-----------------|----------------------|---------------------|
|                                  |            | Trunks                | Extensions  | Abbreviated dialling/codes | Camp on busy line | Teleconferencing | Restricted access | Call charge monitoring | Data collection | Security locks       | Environment control |
| <b>Systems offered in Europe</b> |            |                       |             |                            |                   |                  |                   |                        |                 |                      |                     |
| IBM 1750                         | SD         | 0-96                  | 100-750     | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| 3750                             | SD         | 48-240                | 248-2,000+  | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| ITT Unimat 4080                  | SD         | 0-85                  | 100-384     | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| 4080                             | SD         | 48-400                | 200-2,000   | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| <b>United Kingdom</b>            |            |                       |             |                            |                   |                  |                   |                        |                 |                      |                     |
| Post Office CDS5 1               | TD         | 0-20                  | 20-120      | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| GEC SL-1                         | TD         | 0-800                 | 100-4,000   | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| Plessey PDX                      | TD         | 0-120                 | 100-800     | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| <b>France</b>                    |            |                       |             |                            |                   |                  |                   |                        |                 |                      |                     |
| CIT Cledis                       | TD         | 100-1,800             | 1,000-9,000 | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| Citel                            | SD         | 0-150                 | 12-1,280    | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| Ericsson PE                      | SD         | 1-2,000               | 2-8,000     | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| ITT Unimat 4080                  | SD         | 0-32                  | 12-126      | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| <b>West Germany</b>              |            |                       |             |                            |                   |                  |                   |                        |                 |                      |                     |
| ITT Unimat 4080                  | SD         | 0-32                  | 12-126      | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| Siemens EMS                      | SD         | 2-2,000               | 10-12,000   | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| T&N TN-4030                      | SD         | 5-10                  | 30-100      | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| TN-6030                          | SD         | 5-128                 | 80-960      | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |
| Nixdorf 8811                     | TD         | 2                     | 1           | X                          | X                 | X                | X                 | X                      | X               | X                    | X                   |

Table 1. Stored program controlled PABX facilities. SD = Space division. TD = Time division. \* Not a PABX, but an intelligent integrated voice/data terminal.

tion between handset and computer.

When it is a file inquiry requiring a computer response, the computer can send this via a voice output unit, which the inquirer can then receive through his telephone handset.

Or it can send it to a separate alphanumeric display or printer located within the immediate vicinity of the inquiring handset.

This is not the only converging facility offered on the IBM 1750 and 3750. They can also be equipped with special interfaces for a number of other terminal units, such as identity badge readers and time clock.

The 1750 and 3750 offer special interfaces and communications protocols for all computer systems from IBM's General Systems and Data Processing Divisions.

The switching systems can send an extension user's file inquiry, or collected data to a connected computer. The computer in turn can send dialling signals to the 1750 or 3750 to set up a temporary connection with any extension or with a distant terminal system, if necessary via the switched public telephone network.

IBM itself uses this facility for an internal company electronic mailbox system between its

It is true that in an age of ever cheaper programmable microprocessors, there are fewer and fewer arguments for sharing the control logic of a PABX among so many functions not directly related to voice telephony, as IBM does on the 1750 and 3750. And while IBM does not release such customer details, it is said that only a small proportion of its existing 3750 customers have taken advantage of the optional security and environmental control functions on their systems.

Data collection facilities, and

Instead, data terminals can be connected to these PABXs (except the TN-6030) via the same modems of up to 9,600 bps as on space division PABXs, as ordinary public switched telephone lines.

It looks as if in the planning of the converging applications of the 1980s creative imagination and a capacity for lateral thinking is more important than telephone switching experience and such creative imagination still found predominant among systems and terminal manufacturers.

## RELIANCE COMPUTER LIMITED

CAN YOU AFFORD TO WAIT FOR AN IBM 4331?

WE CAN SUPPLY ON EARLY DELIVERY

IBM 370/138, 135, 125 and 118

Also IBM Peripherals including I/O sets, Discs, Magnetic Tapes

RELIANCE COMPUTER LTD.

79 Commonsdale, Sheffield S10 1GR

Tel: 0742 686251

Telex: 64730

## Low costs of programming in UK offer excellent software market

## LETTER TO THE EDITOR

HAVING spent a good part of my data processing career abroad, including seven years in Hong Kong as data processing adviser/manager with the Hong Kong government (the government data processing department was set up in 1968, not the six years ago you quoted), I was interested in your article on the growth of computer utilisation in the colony (CW, April 26).

The main reasons for the rapid increase in computer utilisation there over the past 11 years was the rapid economic and social expansion which started in 1968 in the wake of the cultural revolution of 1967 combined with a shortage of skilled staff and the inability of the existing mechanisms to handle the escalating amount of work generated by this expansion (eg a 12-fold increase in the number of examination papers over a two-year period from 1968 to 1970).

While the high quality of Chinese programmers did contribute to the rapid expansion in computerisation, the grave shortage of quality experienced staff actually inhibited development.

I would agree with Lee Tate and Richard Wilstead that, on the whole, Chinese programmers are excellent but, before Alex d'Agapeyeff el al pack their bags and hot foot it to Hong Kong, let me sound a cautionary note about the feasibility of establishing a software development presence there.

Costs are much higher in Hong Kong than in the UK. Programmers' salaries are high, and even taking into account a possible higher rate of produc-

tivity, the longer working week (42 hours standard) and a willingness to work long hours, the unit labour cost is higher than here. In addition, office accommodation rentals are astronomical (on a par with downtown New York), hardware costs (purchase or rental and maintenance) are considerably greater and the costs of communication are a not insignificant element.

In 1968, largely on my recommendation, one of the world's largest (US-based) airlines established an application software production unit in the colony. It was closed down in 1971 because the overall cost of the programs written by Chinese programmers in Hong Kong was then greater than those written by American programmers on the Western seaboard of the States.

In the laissez-faire economy of Hong Kong where government regulation and interference is minimal, it would be very easy to set up a software company. This may not be the case in other possible locations. An attempt to set up a software factory in Singapore in 1964 was killed stone dead by the intransigence of the immigration department there and a subsequent effort to establish one in India was frustrated by the dead hand of the cumbersome Indian bureaucracy.

The computer Press has recently reported that ICL and

Systime are considering subcontracting software development to India. These moves led Jim Donaldson, president of CSA, to comment that CSA did not have a protectionist view of its market and could not object to firms taking advantage of programming rates abroad. I don't think that Jim or his CSA members have much to worry about on this score.

My own recent experiences have led me to believe that the costs of programming in the UK

are now about the lowest of the developed nations. Consequently, there is an excellent market for the UK software industry in the production of software in the UK for Western European, American, Japanese and Middle East organisations (hardware manufacturers, software houses and end users).

Only in India are the necessary manpower resources and facilities available and costs lower, but the advantages could well be offset by the inherent difficulties of Indian operations.

G. B. THOMSON  
CAP (UK) Ltd,  
London

## Language translator arrives

NOW available in the UK is the Lexicon LK-3000 pocket-sized language translator (CW, February 1). It provides, for about £159, limited translation from English into languages such as Spanish, Greek, French and German. Stock phrases are

called up and linked together before the machine can give a translation on its one-line display, so the variety of words that can be used is limited.

Pre-programmed plug-in modules store the various languages.

## US small firms go for IBM-compatible market

A GROWING belief that the future of the commercial computer industry is based on IBM-compatible software has caused a blossoming of small US companies all keen to get a share of the action.

The market leaders and pioneers are Andahl Corp and Intel. Andahl's 470V/5 to V/8 line covers IBM from the 370/158 to way beyond the 3033, while Intel's AS series goes from the 4341 to the 3032, with an attached processor option which approaches the power of the 3033.

All the other contenders are competing in the middle and low end of the mainframe market.

Two Pi and National Semiconductor each produce a bit-slice machine with minicomputer architecture and performance comparable with that of the 370/138. Kardos offers the Duo 70, based on the Inteldata 7/32, and Duo 80, based on the 8/32, and matching the 370/138 and 148 respectively.

The forthcoming offerings from Cambridge Memories are also mini-type machines; called the CM-100/1, 2, and 3, they match the 370/118, 125 and 138.

The Magnuson M80/32 matches the 370/148 and the M80/42 and /43 cover the 4341.

The Magnuson line is fully field-upgradable and features what Magnuson terms "strategic architecture", which means that the same basic modules can be mixed and matched to configure a wide variety of different machines, theoretically with interchangeable instruction sets.

Intel Systems makes the Omega 480s marketed in the US by Control Data. They have a unique architecture, which makes them field-upgradable through the line. The 480-I matches the 138, the 480-II the 148 and the 480-III the 168.

Nanodata matches the 135 with the VMX200 and the 148 with the VMX400; the machines are a complex of processing units rather than a single processor. The main memory is central to the system, and is surrounded by several "auxiliary processors", each of which can be microcoded with a different instruction set.

The complex is completed with one or more input-output processors, which can simultaneously link to several instruction processors, and a supervisory processor which controls the operation of the whole complex.

Citel is planning to cover the power range of the 138 to 3033, but is still in the start-up phase.

## COMPUTER WEEKLY International

Inquiries about Computer Weekly International may be sent to these advertisement representatives:

## CANADA

Colin H MacCulloch International Advertising Consultants, 915 Carlton Tower, 2 Carlton Street, Toronto Tel (416) 364-2269 Cables Inadcon Toronto

## FRANCE

Norbert Hellin, 50 Rue du chemin vert, F92100, Boulogne, Paris, France, Tel. 010 33 1 6201571

## HUNGARY

Mrs M. Boddy, Hungary, Budapest Vix Varosiget Tel 225 008

## ITALY

Romano Ferario, Etes-Kompass, SpA, Via Mantegna 6, 20154 Milan Tel. 347051

## JAPAN

Mr Tomoyuki Inatsuki Trade Media, 10-11 Roppongi, Uts House 4-3-11 Roppongi, Minato-KU Tokyo 106 Japan

## NETHERLANDS

Mr Hank Vos, General Sales Manager, Computable, Vijverweg 18-17 Amsterdam Netherlands

## USA

New York  
Mr Jark N. Viora Advertising Sales Manager IPC Business Press, 205 East 42nd Street, New York, New York 10017 (212) 8672080.

Mr Raymond V Barnes IPC Business Press, 205 East 42nd Street New York New York

Computer Weekly International is sent free of charge to the following categories: Company directors, company secretaries, management services executives, civil servants responsible for computing, management/computer consultants, lecturers and teachers, data processing managers, systems analysts/O&M officers, programmers, operators, computer salesmen, field engineers.

## Chicago

Mr Jack Farley, The Farley Company, Suite 1548, 35 East Wacker Drive, Chicago, Illinois 60601 (312) 348-3074

## Cleveland

Mr Jack Mantel, The Farley Company, Suite 605, Hanna Building, Cleveland, Ohio 44115 (216) 621-1918

## Florida

Mr Ray Rickles, Ray Rickles & Company, P.O. Box 2008, Miami, Florida 33140 (305) 532-7301

## Atlanta

Mr Frederic A. Bauer, Ray Rickles & Company 3116 Maple Drive NE, Atlanta, Georgia 30305 (404) 237-7432

## Los Angeles

Victor A. Jauch, Elmatex International, P.O. Box 34607, 7742 Redlands Street, Suite H-3021, Playa Del Rey, CA 90231, U.S.A. 213 821 8581

## Houston

Mike Loughlin, IPC Business Press Ltd, 14724F Perimeter, Houston, Texas 77079 Tel

## Memories are made of these



Nashua Computer Products specialise in the manufacture of magnetic media for the computer and word processing industries. Products that are designed to meet or exceed all known international industry specifications.

So don't forget Nashua products—they're just the thing memories are made of.

**NASHUA**  
Serving the World's Computers.

To Frank Skinner, Nashua Computer Products, Cory House,

The Ring, Backwell, Berke RG21 1ET

I want to know more about the Nashua range of computer products. Please send me full details.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**NICHOLAS ENTICKNAP** has been investigating the value of performance measurement, and in this article reviews the options open to managers of both large and small systems. In a second article, to be published next week, he will report the experiences of users.

**01-491 4706**

Readers who are interested in this event, or in the Association generally, should contact Nick Kenyon of Logica, at his office in Little Portland Street, London W1, or Scott Yasler, the European Computer Measurement Association, Scheuzerstrasse 5, 8008 Zurich, Switzerland.

To give an idea of how prices, Cus and TSA offer various optional features on each marketed for £10,000. An MVS package pricing CME, TSA and the other double market.

# Knight



## Computer Operators

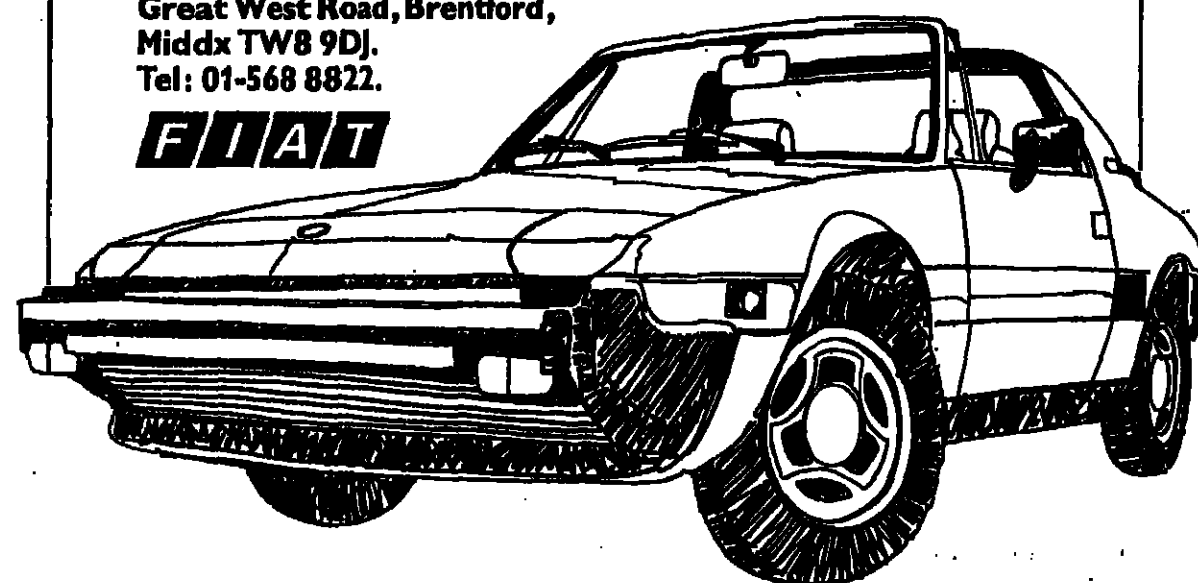
## With your experience, there's no better shape to be in...

You can see for yourself the shape Fiat are in just by looking at our cars. Our style is unquestionable and we have the hardware to back it up, as you'd quickly appreciate behind the wheel of our X1/9. And you could well be by participating in our attractive car purchase scheme. It's all part of getting your experience into shape with Fiat.

Of course, we're looking for a good track record from you... ideally, around two to three years' IBM experience, because you'll be working on IBM 370/38, supported by DOS/VS and POWER/VS, and PDP 11/70 supported by RSTSE.

In exchange for this experience, you'll receive a salary package of around £4600, which includes payments for working shifts, and subsidised canteen... and the car scheme we mentioned. Fiat's genuine promotion prospects will also be doing their bit to help your experience shape up to your own expectations.

For full details, please telephone or write to  
**Mrs. E.F.C. Watt, Personnel Manager, Fiat Motor Co. (UK) Ltd.,**  
**Great West Road, Brentford,**  
**Middx TW8 9DJ.**  
**Tel: 01-568 8822.**

JBA

## European Technical Support Manager

### Amsterdam

The European Marketing Centre of one of the world's leading manufacturers of information display and graphic systems wish to appoint a Technical Support Manager.

The successful candidate will liaise between the marketing centre and subsidiary companies (and distributors), assess all product parameters with respect to market demands and make relative and comparative studies on competitive products. Conventional management responsibilities will form a large part of the job, together with providing assistance and guidance to product support managers, sustaining a highly efficient technical support service and keeping in close contact with all hardware and software technology.

Applicants must have a technical degree (or equivalent) plus over six years software engineering experience with minicomputers and mainframes in systems software and FORTRAN based applications. At least two years direct management experience of a medium sized group in marketing support, software maintenance or project development is sought. English fluency essential and another European language desirable but not mandatory.

Very attractive salary and benefits, including relocation package.

Contact: Mike Creamer  
**JAMES BAKER ASSOCIATES,**  
International Personnel Consultants,  
16 Maddox Street, London W1.  
Telephone: 01-491 4478.

## Business Systems Analysts

West of England £8,000-£9,000

Our client is looking for two senior Business Systems Analysts with successful track records of development and implementation of computerised manufacturing applications, preferably in an on-line/real time environment. One Analyst is required to lead primarily INVENTORY and PRODUCTION applications, while the second will concentrate on COSTING and FINANCIAL applications.

These are key appointments within a new data processing function and each analyst must be capable of setting up and leading major development projects. Top management has a demanding commitment, based on experience, in the use of computers, and full support will be given to development of applications.

The Company is a major electronics engineering organisation with a turnover approaching £30m, an explosive growth rate and microprocessor based products in established, world-wide demand. The appointments present an ideal opportunity for career development within and outside the data processing function.

Salaries will be in the range £8,000-£9,000, coupled with a comprehensive benefits package, and relocation expenses will be met by the Company where appropriate.

TO APPLY, please write briefly, listing name, address, age, home and office telephone numbers and career history to date, including current and previous employers, in complete confidence, to ANTHONY SPURR, Executive Selection Division, quoting 720/INV/PROD or 720/COST/FIN as appropriate. Applications from either sex.

BIS Applied Systems Limited  
York House, 199 Westminster Bridge Road  
London SE1 7UT  
Telephone: 01-633 0866



## Area Sales Manager

Bureau Services  
London + Home Counties

From £11250 (on Quota)  
+ 2 litre car

You are currently selling bureau services, have a proven track record and are now looking for a management position. Alternatively you are already controlling a sales force but wish to move into an environment where you will have real influence over both your own and your company's future. Either way we would like you to evaluate the position our client offers very carefully:—

### Features

- ★ One of the leading Computer Service Bureaux in the UK.
- ★ Complete range of computer based services.
- ★ Nationwide communications network.
- ★ 50% growth in 1978.
- ★ Stable, professional sales force.
- ★ Sales team exceeded quota by 80%.
- ★ Projected '79 growth 50%, projected quota increase 25%.
- ★ Superb technical support, with high sales awareness.

### Benefits

- ★ Large existing customer base offering real development potential.
- ★ Maximum sales opportunities.
- ★ Nationwide sales potential.
- ★ Outstanding career development opportunities.
- ★ Opportunity to participate in strategy and policy making.
- ★ Immediate high income assured.
- ★ Natural income growth gearing.
- ★ Impressed prospects and satisfied customers.

If you feel that this describes the type of organisation that you are looking for then we would like to meet you for a preliminary discussion. Please telephone or write to Kevin McCourt quoting Reference 2381.

  
**Lloyd Chapman Associates**  
123, New Bond Street, London W1Y 0HR 01-499 7761

# YES

Urgently required for Holland  
Enthusiastic Systems 34  
Programmers who would like to earn in excess of £11,000pa  
Please write to Norma Davies at 01-953 4066  
Address and be recognised  
Howard Organisation  
International Ltd.  
Employment Business Section,  
11 Dore Lane, Borehamwood, Herts

UNIVERSITY OF LONDON  
SENIOR ASSISTANT  
LIBRARIAN -  
SYSTEMS ANALYST  
Library Resources Co-ordinating Committee

A factor Assistant Librarian - Systems Analyst is required to develop, implement and maintain computerised cataloguing services for the Library of the University. Candidates should be experienced in library work or in the application of computers to library management.

Salary in Grade UB range of Senior Librarian £8,585 - £24,422 per annum (under review) plus £802 London Allowance.  
Further particulars and application form obtainable from the Personnel Office, University of London, Senate House, Malet Street, London WC2E 7HU. Tel. 01-834 8000, ext. 16. Closing date 22nd June, 1979.

£4000 - £7000 +  
North + Midlands  
Analysts & Programmers  
081-832-4184  
Transfer checks to  
Sampson Staff

## Our 'Bugs' are light Sensitive!

### SYSTEMS PROGRAMMERS

Your daily life will shortly revolve round MICROPROCESSORS - we can offer you the chance NOW to develop your career in parallel with rapidly advancing technology.

We're the fastest route to tomorrow and you could soon be on your way with us, utilising your skills and ingenuity to the limit in a real-time industrial environment. We can promise you total involvement from system conception to commissioning, including "hands on" machine usage, playing a vital role in an internationally renowned company with an ever increasing demand for its products.

Just fill in the coupon and post to us - no stamp needed - or phone DAVE TYSON on 01-953 2030 Extn. 3377.

GEC Traffic Automation Limited (Freepost)  
Elstree Way, Borehamwood, Herts WD6 1BR.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Years of experience  
✓ Box  
□ 1-2 □ 2-3 □ 3-4  
□ 4-6 □ 6-8 □ 8 & over  
Language experience  
✓ Box  
□ Babbage  
□ Intel Assembler  
□ Coral 66  
□ Fortran  
□ Others (Please specify) \_\_\_\_\_  
Home Tel No. \_\_\_\_\_  
Office Tel No. \_\_\_\_\_  
(if convenient) Age \_\_\_\_\_  
Present Company \_\_\_\_\_  
Position held \_\_\_\_\_

Qualifications  
✓ Box  
□ Degree or Equivalent  
□ HNC or Equivalent  
□ 'A' Level Maths  
□ 'A' Level English  
Present salary:  
✓ Box  
□ £3000-£3500  
□ £3500-£4000  
□ £4000-£4500  
□ £4500-£5000  
□ £5000-£6000  
□ £6000-£7000

Tomorrows world can be yours today.



## 1 year's Fortran? Looking for hands-on mini experience in an exciting environment?

We are starting new projects in the fields of process monitoring and control using mini-computers and require young programmers, male or female, with potential and ambition who wish to gain valuable experience in real-time computing.

If this appeals - Irrespective of your previous experience - DON'T HESITATE!  
Telephone or write to Chris Hill.

Marconi Avionics Limited, FREEPOST  
Elstree Way, Borehamwood,  
Herts WD6 1BR. Tel 01-953 2030 ext 349  
Please quote reference MA 79002.  
**MARCONI AVIONICS**  
A GEC-Marconi Electronics Company



# Systems & Applications Programmers

## Up to £10,000 now plus bonus

### Technical Interviews-London, Manchester, Leeds, Liverpool, Birmingham, Stafford.

UK based opportunities exist for programmers with the right qualifications or potential to earn £8,000 to £10,000 now, and up to £16,000 after two years. These are long term positions, most of our staff have been with us for over five years. In our dynamic and flexible environment, career development will be upwards or across or into new areas such as Sales or Marketing.

#### The company

Altergo Software Limited is one of the world's most successful suppliers of software products to users of IBM 360/370, 303X, 4300 and compatible mainframes. We develop, implement and maintain some of the most advanced and efficient products available on the world's markets. To complement the quality of our products, we provide technical support of the highest quality to ensure that our users obtain the maximum benefit from our systems. Systems such as the SHADOW II teleprocessing monitor; the GUTS Time Sharing, Text Editing and CRJE system; the QUOTA II On-Line Source Program Library and Maintenance system; the CPG On-Line Program Generator; the OPLS On-Line Order Processing system and the DATA-MAN Report Generator.

#### The job

Continuing rapid expansion means that we have opportunities for technical staff in both our London and Stafford offices to join following teams. Full relocation assistance will be given.

#### PRODUCT DEVELOPMENT

As a member of the development team you will be involved in the development of new software products, the development of new features or enhancements to existing products or the implementation of existing products on new IBM or IBM compatible mainframes and other advanced devices.

As part of one of the most creative software teams in Europe, you will have the opportunity of working in project teams or alone, gaining from and contributing to the wealth of experience of this friendly and highly motivated group of technicians.

Development work is all on-line using our 3270 and silent-700 terminals.

#### SOFTWARE SUPPORT

You will have the responsibility of maintaining the company's well earned reputation in this all important aspect of software marketing.

You will be involved in pre-sales advice, guidance and consultancy, post-sales product implementation and training. You will also be in close contact with users and our Agents worldwide, identifying, reporting and solving problems.

As a member of the support team you will enjoy considerable job satisfaction in a flexible, extremely interesting environment. The scope for extending

your knowledge and experience of a wide variety of systems and installations is virtually unlimited. Your knowledge of our products, user base and user requirements will also provide you with the opportunity to transfer to the development team in the future.

#### T.P. APPLICATIONS

The TP Applications team will provide you with the opportunity to work on a variety of new SHADOW II applications for customers. You will also be involved in advising and aiding U.K. and overseas clients in the conversion of their systems from other T.P. monitors such as CICS, to SHADOW II. The wide range of applications environments of some of the most advanced installations in the U.K. will provide invaluable experience for programmers who wish to advance their careers rapidly.

#### The skills

SYSTEMS PROGRAMMERS. A good working knowledge of teleprocessing in a DOS or OS environment is required. Assembler experience is essential. COBOL, PL/I and/or Database experience are all added advantages. APPLICATIONS PROGRAMMERS AND SENIOR PROGRAMMERS. A strong Assembler background is required if you wish to join the Development or Support teams.

For the TP Applications Group you should have On-Line Applications experience in either Assembler, Cobol, PL/I or RPG II.

#### The rewards

Salaries well above the industry's level. Significant annual bonus. Full relocation expenses for the right people. Regular opportunities for travel overseas — U.S.A., Canada, Europe. Full product training. Half yearly salary reviews. Friendly informal environment. Continuing job interest. Dynamic and reward-oriented company.

#### MAKE A CAREER WITH THE MARKET LEADERS.

Interviews will be held from 21st MAY in London, Manchester, Liverpool, Leeds, Birmingham and Stafford.

Our Development and/or Support managers will be available to discuss your career opportunities.

As a first step to arrange an interview in your area, please send your c.v. to, or telephone (writing) C.W.2: Pat Baker, Altergo Software Limited, 5th Floor, Imperial House, 15-19 Kingsway, London WC2B 6UN. 01-436 9075.

**altergo**

## Accounts Systems Officer

### GUILDFORD

We are an old-established composite insurance company with assets in excess of £140M.

Expansion and change has led us to create a new position — ACCOUNTS SYSTEMS OFFICER. Reporting to the Home Accountant, the successful applicant will be responsible for designing and implementing accounting systems and for daily liaison with the Data Processing Department.

The ideal candidate will have five years' experience of systems analysis and programming with some of that time on accounts work. A working knowledge of accountancy is essential. Applicants should be capable of working on their own initiative and of clear communication.

We offer a competitive salary and the usual benefits associated with a large financial institution.

Write or telephone for an application form to: Mrs E. Watts, Personnel Manager, Cornhill Insurance Co. Ltd., 57 Ladymead, Guildford, Surrey GU1 1DP. Tel. (0483) 65181.

**Cornhill Insurance Group**

## 2 PROJECT LEADERS

REQUIRED IN THE MIDLANDS  
BY AN ESTABLISHED  
SOFTWARE HOUSE

Assembler language or ICL System Ten experience an advantage but not essential.

Earnings £6,000-£7,000 p.a. plus company car.

Telephone: 021-454 6058  
M.F.T. COMPUTERS LTD.  
Tricorn House  
Hagley Road  
Edgbaston  
Birmingham B15 8TP

**MFT**

#### BUSINESS SYSTEMS SALES

£10,000 + car  
Applicants must have sales experience preferably related to small business systems although Analyst/Programmer with no sales support experience will be considered. N. SURREY

#### MINI or MICRO

ANALYST/PROGRAMMER  
Small business systems or manufacturing environments experience a distinct advantage. Location London W1 relocating to N. SURREY

SYSTEMS ANALYST C. £7,000  
PROGRAMMER/ANALYST C. £5,500

A commercial organisation with an ICL 2960 DME machine using COBOL requires people with a minimum of 2 years experience to join a friendly DP team in London, W1.

PROJECT LEADER C. £8,000  
SYSTEMS ANALYST C. £6,500  
ANALYST/PROGS. C. £6,000  
PROGRAMMERS To £6,000

The above staff are required to make positive contributions to the development work in a large DP installation based in N. SURREY

SENIOR PROGRAMMER/ANALYST To £6,500

A British subsidiary of a major European company with world wide connections is seeking a Programmer/Analyst with COBOL experience and management ability. The installation is an IBM 370/158. Location SW LONDON

ANALYST C. £6,000  
A prestigious company with world wide operations is seeking young Systems Analysts to design and implement production/procurement applications. A year's analysis experience or Analyst/Programmer experience is essential. SW LONDON

OPERATORS £4,200  
2 years' experience required on ICL 2900/1900 using under GII + IBM 370 experience considered. 3 shifts system. City

If you are interested in any of the above positions, please telephone for an application form. Alternatively if you are seeking a position in an area we have not listed above, please telephone for details.

**AMES PERSONNEL**

Employment Agency Suite 14, Dryden Chambers, 119 Oxford Street, London W1R 0PA Tel. 01 434 1105

## Deputy Shift Leader

Up to £5018 (incl. shift pay)

A vacancy exists for a suitably experienced operator in our operations team running a 2 shift ICL 2960 under both VME/B (including 1 P.) and DME/S4.

Operators with a least 2 years' experience under either VME/B or System 4 J Level could find this a satisfying opportunity to further their career towards shift management in an expanding and progressive environment.

Application form from the Chief Executive, 50 Woodstock New Road, London SE18 8HQ (Tel. 01-854 8883, Ext. 2034).

Closing date: 15th June, 1979.  
The Council is an equal opportunity employer. All applicants will be considered, irrespective of sex or colour or origin.

## GREENWICH

### SENIOR ANALYST PROGRAMMER

A vacancy has arisen within the computer department of the multiple shoe retailer with 200 branches, for a person with the following qualifications. Honeywell Cobol, DOS, 2,000/native (operating systems), wide experience of commercial applications with emphasis on stock control, ability to communicate internally and externally with staff at all levels. Communications and data based systems would be an advantage.

The department at present runs a Honeywell 64/200 with Annex OCR machine, and offers job satisfaction, good working conditions and competitive salary. Applications in writing or telephone to:  
J. A. Kerr, D.P. Manager  
Tandem Shoes Ltd.  
798 Old Edinburgh Road  
Belfast, Londonderry  
Tel. Belfast 748321

**TANDEM shoes**

#### IBM + ICL OPS

IBM OS VS1 £4600  
6 mths + exp for City Bank. Fast promotion for the right applicant.

IBM OS VS1 £4400  
370 op required for Croydon company with recently installed 3031.

IBM OS VS1 £5500  
Shift leader with 2 yrs + exp required by Middlesex based installation.

IBM OS VS1 DAYS £5500  
West London Company seeks operations analyst. Suit exp op with good OS JCL.

IBM 370 DAYS £4500  
Operator with some JCL knowledge required to take control of sys 34 to be installed shortly.

IBM DOS VS £4800  
East London co. requires operators with 6 mths + experience. 2 shifts only.

ICL 1900 £5500  
Shift leader required with 2 years + GII exp. Good Macro knowledge. 2 shifts only.

ICL 1900 £4600  
Chance to learn 2960 at this large C.London installation. 6 mths + ICL required.

ICL 1900 £4200  
6 mths + exp required by bureau. Excellent prospects include move to programming.

ICL 2900 £4300  
Shift leader required with 1 yr + 2903/4 exp. 2 shifts only.

#### TECHNICAL CONSULTANT

C. London CE10,000

For people interested in the Software House environment there are currently vacancies in the Real Time and Communications fields within one of the best companies in London.

You should have 5 years experience in either message switching applications, sales support, PDP 11's, turnkey systems or data communications and wish to progress into a Technical Sales/Sales Support Role. The company offers an excellent salary plus a full pension scheme, interest free season ticket loans, L.V.'s staff purchase facilities and a house purchase scheme.

Reference HK 22/1

#### JUNIOR FORTRAN PROGRAMMERS

West London to CE4500

A well known company in the Consumer industry currently needs several Junior Programmers who wish to build for their own future.

The minimum experience required is just 6 MONTHS FORTRAN programming on any mainframe or mini. Training in systems Analysis will be provided and exposure to mainframes (an IBM 370/138), mini computers (on Prime 300's) and micro machines, will all ensure a wide range of experience and a 1st class choice of career prospects in the future.

Reference HK 22/2

#### BASIC/BASIC+2 PROGRAMMERS

City to CE8000

A well known Software House based in the City are currently seeking BASIC+ & BASIC+2 Programmers to work on their growing range of applications, covering both the Scientific & Commercial areas.

A minimum of 12 months Basic+ 2 or 18 months Basic+ is required and any knowledge of DEC Hardware would be advantageous.

The company offers very good salaries with other benefits including a bonus scheme.

Reference HK 22/3

#### ANALYST/PROGRAMMERS

West End to CE7000

An International Pharmaceutical company based in the west End with a range of MINIs and Mainframes in key locations throughout the U.K. are seeking Analyst/Programmers with a minimum of 1 years experience. A knowledge of CORAL 66 would be ideal but retraining will be provided to applicants with good programming and analysis experience.

They offer competitive salary plus all the fringe benefits you would expect from a company of their size and standing.

01.439.7871

Reference HK 22/4

Datascene Recruitment Ltd  
169-173 Regent Street  
London W1R 7FB

01-439 7871

#### OTHER OPS + DATA CONTROL

HONEYWELL GCOS DAYS £4500  
Op with 18 mths + experience pref on Honeywell required by South London installation.

BURROUGHS B6700 to £5600  
1-3 years Burroughs medium systems exp for this large site. Good promotion prospects.

HONEYWELL GCOS £4650  
Operator with 6 mths + exp for this 2 shift working installation.

NCR B4 £4500  
Chance to learn Criterion if you have 1 yr + NCR experience. Prof. BA.

DEC PDP £4500  
South London installation requires operator with 1 yrs experience. 2 shifts only.

UNIVAC DATA CONTROL £4000  
Central London installation requires a Data Control clerk with knowledge of Univac JCL.

ICL 1900/2900 DATA CONTROL £3300  
Any Data Control experience for this company in West London. Flex-time. Age 25+.

ICL 2904 DATA CONTROL £3500  
1 to 2 years exp in Data Control environment. Days only.

HONEYWELL DATA CONTROL £3500  
North London installation requires a Data Control clerk with 1 years experience. Could progress into programming.

IBM OS DATA CONTROL £4400  
9 months exp either operating or in Data Control for this centrally based company.

#### SENIOR COBOL PROGRAMMERS

West London to CE7000+ Benefits

A major retail group with an expanding installation is seeking several Senior COBOL Programmers with a minimum of 3 years ICL 1900/2900 experience. The Company operates a retail distribution system with considerable real time involvement, thus offering the opportunity for people with solid experience to gain valuable Real-time exposure.

They offer very good salaries with considerable benefits including staff discounts, non contributory pension and a subsidised staff restaurant.

Reference BP 22/8

#### JUNIOR COBOL PROGRAMMERS

City to CE6000+ Mortgage

A major financial organisation operating a twin ICL 1900 series installation is seeking several Programmers with a minimum of just 12 MONTHS' COBOL. The Company is involved in a number of new financial systems so any experience here, although not essential, would be more than welcome.

In return they offer very good salaries, 80p per day L.V.'s, 4 WEEKS HOLIDAY, and a 32-HOUR WEEK, and if that is not enough then consider their 3% MORTGAGE scheme!

01.439.7871

Reference BP 22/9

#### JUNIOR SYSTEMS ANALYST

City CE6,500+Mortgage

A major financial organisation operating an ICL 1900 installation which will be updated to an ICL 2960 by the end of the year, is seeking a Junior Systems Analyst who is looking to expand on their current experience.

The minimum requirement is 18 months' systems experience gained on any hardware. A programming background would be useful although not essential. The Company offers a very good starting salary together with extremely good fringe benefits including a 4 % MORTGAGE, BONUS, FREE LUNCH, season ticket loans, non-contributory pension etc.

Reference BP 22/10

#### SYSTEMS ANALYSTS

City to £7000

A major finance company based in the City wishes to recruit additional staff to work on the development of new projects for their expanding IBM 370 system.

The individuals they are seeking will have at least two years Analysis and must have implemented one major system. Any knowledge of CICS or PL/I would be a distinct advantage.

In addition to a highly competitive starting salary the company offers an attractive benefits package and excellent working conditions.

01.439.7871

Reference BP22/11

#### OPERATIONS SUPPORT

Sidcup to £5000

A large International Organisation based in an easily accessible part of N.W. Kent is currently looking for staff at various levels for their expanding technical support department. A minimum of 1 years operating or data control experience is required, preferably with some IBM OS JCL knowledge, although this is not essential.

The installation is linked via a Data 100 network to a large 370/158 running under OS/VS1. The technical support department operates a flexitime system and therefore this is an ideal opportunity for operators to move from shift work into an interesting and demanding days only position.

There is a recognised company career path which includes the possibility of moving into programming in the future. Excellent staff benefits include discount on a wide range of products, staff restaurant, and an active sports and social club, one of the amenities being a swimming pool on site.

01.439.7871

Reference MH 22/5

## CONTRACTS

### PROGRAMMERS & ANALYSTS

REGISTER NOW FOR IMMEDIATE & FORTHCOMING REQUIREMENTS THROUGHOUT

### LONDON ★ U.K. ★ EUROPE

DUE TO OUR CONTINUALLY CHANGING REQUIREMENTS WE ARE ALWAYS INTERESTED IN HEARING FROM COMPUTER PROFESSIONALS WITH A SOLID D.P. BACKGROUND TO WORK WITH MAJOR CLIENTS WHO ARE ALWAYS ABLE TO OFFER A WIDE VARIETY OF INTERESTING & CHALLENGING REQUIREMENTS.

REMEMBER: WE PROVIDE TOP CONTRACTS  
WE PAY TOP RATES

CALL

BOB EDWARDS

TELEX 25851

01.439.1856

### PL1 PROGRAMMERS

West End to £5500 + Mortgage

A leading commercial organisation with an expanding 370/135 installation in the West End is seeking a number of PL1 programmers to work on a variety of new and existing projects.

The positions are ideal for enterprising young programmers with at least twelve months experience on IBM Hardware. A knowledge of OS/VS1, although not essential, would be a distinct advantage. The company offers a first class salary, and fringe benefits include Flexitime, Season Ticket Loans, and a Subsidised Mortgage.

Reference BP 22/6

### COBOL ANALYST/PROGRAMMERS

C. London to CE8500

One of the country's largest retail organisations is seeking several people with a COBOL background, but with an interest in other languages.

They use a 370/145 & have development projects for a 3031 in COBOL, ASSEMBLER & PL1, & you will need around 18 MONTHS or more in any of these languages.

Any Analysis or D/B experience would be helpful, however, training will be provided, making this an ideal opportunity to diversify your career.

01.439.7871

Reference BP 22/7

Datascene International Ltd. Telex: 25851

Sceptre House  
169-173 Regent Street  
London W1R 7FB

01-439 1856

**datascene**

Computing Services Association



**URGENT**  
2400 p.m.

**DATA GENERAL NOVA ALGOL & RDO'S**  
experience to work on Management information systems.

**2000**  
ENG

**3 AVENUE**  
**PANIS**  
**BRUSSELS**

VMEB experience. 3/6 month projects.

**PROG. MANAGER**  
EXP. 10 yrs.

**HOLLAND**

PDP Programmers with TRAX exp. transaction system. 3 months' initial contract.

**SYSTEMS PROG**  
£5000 p.w.

**RSX11M** systems programmer to work on a packet switch project and system internals. Preferably knowledge of French, German or Dutch.

**ENGINEER**  
£2500 p.w.

**U.S.A.**

Level 6 expertise with T.P.S. combined UK + USA project.

**PROG. MANAGER**  
EXP. 10 yrs.

**HOLLAND**

Singer system 10 expertise is needed with stella package experience.

**TELEPROCESSING**  
EXP. 10 yrs.

Teleprocessing, writing functional and interface specifications.

**DEC PDP** using Fortran under RSX11M: Traffic control project. 3 months' initial contract.

**PROG. MANAGER**  
EXP. 10 yrs.

Small business systems experience. Preferably knowledge of low level protocols. Initially 3 month contract.

**SYSTEMS PROG**  
£5000 p.w.

Banking experience. Project planning software documentation. Knowledge of COBOL. Preferably large mainframe exp. Fluent French.

**MOTOROLA 6800** with MPL Assembler 3 months initial contract.

**KN. OF PROTOCOLS** X25 HDLC exp. of low level protocols. Conversant at all levels management.

**PDP MUMPS** exp. commercial applications 1 year project.

**SYS 3/RPGII** exp. commercial applications. Maintenance and development. 1 year + assignment. Fluent French.

**IMPLEMENTATION** experience on machine interface via visual display.

**£450**

Working on PDP II hardware. Expert knowledge of RSX11M. To install RSX11 at installation.

**CHALLENGING** position to install and coordinate D.P. department: Management exp essential.

**KNOWLEDGE** of work processing systems and their functions.

PLEASE CALL 01-734 0152/734 3078 and ASK FOR THE CONTRACT DIVISION

**KNIGHT PROGRAMMING  
SUPPORT LIMITED**

ROYALTY HOUSE, 72 DEAN STREET, LONDON, W1  
OFFICES: LONDON, MANCHESTER, BIRMINGHAM, HOLLAND, FRANCE

RECRUITMENT CONSULTANTS

## NEW DEVELOPMENT OPPORTUNITIES

**PROJECT MANAGER**  
**ANALYSTS**  
**PROGRAMMERS**

- ★ Discretionary bonus
- ★ Subsidised restaurant
- ★ Contributory pension scheme
- ★ Sports and social club — Subsidised bar!

Major group with subsidiary companies operating internationally and manufacturing a wide range of sophisticated industrial equipment has exciting future plans. Retaining IBM 370 hardware, they are currently installing CICS and have various projects planned including a major financial one. A mini computer is also being installed for a Midlands depot, with support from London.

Chief Systems Analysts is sought to work in capacity of PROJECT MANAGER and will be expected to have around 7 years' D.P. experience in any environment, but with a good business acumen. ANALYSTS will have slightly less experience. PROGRAMMERS with 2-5 years IBM OS COBOL experience will have opportunities to enhance their career.

**NEW POSITIVE**  
**WORLD WIDE**

Ref. 2342

- ★ FREE LUNCHES
- ★ Contributory pension, free life assurance
- ★ NEW projects — NEW mainframe evaluation
- ★ Easy access either by road or rail

A RARE OPPORTUNITY! Due to rapid growth within major group services division, there are now various openings for career-minded D.P. persons. Retaining ICL 1900 equipment, Co. has recently evaluated new hardware, has large mini computer-based network and utilises TOTAL DBMS.

**PROJECT LEADER:** Successful candidate will have had 5 years' systems experience, a professional approach to project management and ability to communicate at all levels. He/she will have full responsibility and cover whole spectrum of project control.

**PROGRAMMERS:** Up to 5 years COBOL GII experience preferably using database. To assist in systems design, write program specs and lead programming teams. Prepare schedules and estimates.

**NEW POSITIVE**  
**WORLD WIDE**

Ref. 2342

**PROJECT MANAGER**  
**ANALYSTS**  
**PROGRAMMERS**

- ★ Subsidised Mortgage
- ★ Cheap Loans and Banking facilities
- ★ Non contributory pension and Life Assurance Scheme
- ★ Luncheon Vouchers, S.T.L.S. Overtime + 4 weeks hols.

Get into banking! This major international bank has superb opportunities to join an exciting environment with new development work. Our client retains an IBM 370 with major new hardware on order and offers TRAINING in CICS. They require a PROJECT LEADER with management qualities, good communication skills and banking systems exp. preferably in foreign exchange or investments. The ANALYSTS are required to join NEW PROJECTS in the initial stages of design. PROGRAMMERS with at least 2 years' COBOL are needed to work on many financial applications. For the analysts and programmer all positions offer fantastic scope for learning new skills and career progression.

- ★ Regular salary reviews
- ★ Early promotion prospects
- ★ Co offers excellent training courses
- ★ Variety of work

Our client, an international communications group, has recently set up a second-major D.P. dept. It has been created to deal specifically with the business and financial areas. It has IBM 370 which runs under DOS and CICS will be used shortly. Company has exciting future plans and offers all new development work in stimulating international environment. Programmers with at least 18 months' COBOL (on any hardware) here is your opportunity to develop, with super prospects to get into systems analysis. 1 year's analysis experience with COBOL is all you need for the analyst programming positions. If you are a systems analyst with wide DP experience and good IBM background — PHONE NOW!

**NEW POSITIVE**  
**WORLD WIDE**

Ref. 2342

PLEASE CALL 01-734 0152/434 1363 QUOTING REF. NO.

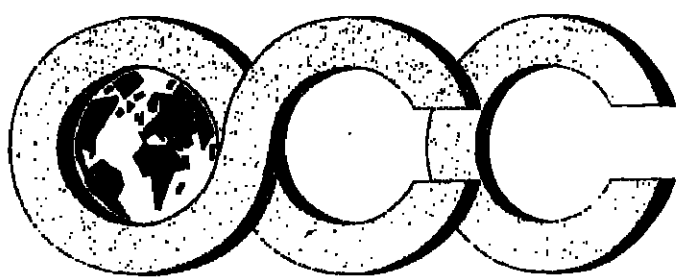
**KNIGHT PROGRAMMING  
SUPPORT LIMITED**

ROYALTY HOUSE, 72 DEAN STREET, LONDON, W1  
OFFICES: LONDON, MANCHESTER, BIRMINGHAM, HOLLAND, FRANCE

RECRUITMENT CONSULTANTS

Ref. 2342





*Specialists since 1971 in UK and International computer appointments. We have many other jobs on our files and offer a career counselling service to computer professionals.*

## PARIS - LONDON

Our clients are a Multinational company with corporate offices in Paris and an established company in London.

The following vacancies are available.

### PARIS Analyst/Programmer

80,000 - 90,000  
francs p.a.

We are looking for one, or possibly two experienced persons with a mini Real Time Systems background in commercial applications to work on new application projects. Candidates must be self motivated and able to work on their own. A basic knowledge of French, sufficient to read documentation and to communicate with the French teams is also required. *Ref: 511/CW/RN.*

### LONDON Analyst/Programmer

£5,000 - £7,000 p.a.

The London vacancy could be filled by a less experienced person with a minimum of two years Real-Time mini programming. *Ref: 512/CW/RN.*

For all vacancies a knowledge of Hewlett Packard 3000 or PDP11 systems will be a distinct advantage as would previous experience on accounts or shipping applications.

*For an informal discussion or to apply for any of the above vacancies, please ring Renée Nute on (day) 01-242 9356 or (evenings and weekends) on 01-874 6372.*

OCC Computer Personnel Limited, 16 Bedford Row, London WC1R 4EB



## MINI COMPUTER MANAGER

Salary £8000 c. Plus car

A substantial marketing orientated company based in Essex is seeking a first class computer professional to develop, manage and implement substantial changes to its computing facilities. The brief will involve choosing a new computer and creating a small team of specialists and to develop and implement new systems for the 1980s. The right candidate (male/female) will need a creative and hard working mind. Please respond in writing to the Managing Director, H C Marshall, Nor Systems Limited, Valley Road, Harwich, Essex CO12 4RR.



## INTER-SIL TECHNICAL SUPPORT ENGINEERS

Inter-sil a leading manufacturer of IBM plug compatible hardware requires additional engineers for its expanding European support operation.

Suitable candidates will have considerable in-depth experience of maintaining mainframes and will preferably be trained to specialist level on an IBM C/P, or related plug compatible memories.

Successful applicants will be working mainly from home as a base. They will be prepared to travel to any part of Europe in order to support Inter-sil clients.

Proven ability will be well rewarded along with excellent fringe benefits.

Inter-sil is an equal opportunity employer. Applications should be sent to: Mr. J. Jarvis, Inter-sil, 28 Maddox Street, London W1R 9PF. Telephone: 01-629 5932.

## Computer Operator

£3,900 - £4,300  
(currently under review)

BICC, a major British group with over 100 sites both at home and abroad, are seeking a Computer Operator (male/female) for our Regional Computer Centre based at Wallington, near Croydon.

The centre, which provides a DP service to the Group's member companies is equipped with an ICL 2903 with data communications facilities operating on a 2 shift system.

Ideally candidates should have at least 12 months operating experience on a 1900 series installation but consideration will be given to people of lesser experience.

Conditions of employment are attractive and commensurate with a large multi-national company. Please telephone or write to:

Mr. D. Blinkhorn,  
Regional Controller,  
Kelvin House,  
London Road,  
Wallington,  
Surrey SM6 7EH.  
Tel: 01-689 4477 Ext. 329



## Contract Programmers-Analysts

If you thinking of doing contract work why not start here by registering now for immediate and forthcoming requirements.

For further details contact:  
Bridget Kotchie

RENDECK LTD. 100 New Bond St.  
London W1. Tel: 01-629 5438



## XOREN REAL-TIME MINI SOFTWARE SPECIALISTS £6,000-£9,000

Xoren Computing Ltd., is an independent UK-based software house specialising in systems design and programming of real-time systems for computer and microcomputer systems. The Company has experience of carrying out projects in the following fields:

**BASIC SOFTWARE** - Operating Systems, Compilers, Linkers, Debug Packages, Text Editors, Report Drivers.  
**COMMUNICATIONS** - Telephone Systems, Message Batching, Data Collection, Concentrators, Terminals, Emulators.  
**PROCESS CONTROL & TELEMETRY** - Pipeline Control, Alarm Monitoring, Distillation Simulation, Materials Testing.

The Company possesses its own PDP 11/34 computer which is in-house for software development. Applicants should have a sound knowledge of real-time systems experience of at least one microcomputer or microcomputer system, or telephone Mr. J. Jarvis.

Xoren Computing Ltd.  
28 Maddox Street  
London W1R 9PF  
Telephone: 01-629 5932

£10K+  
APPOINTMENTS  
pages  
begin June 7  
Ring Eddie Farrell  
01-261 8097

# MYRIAD HOLLAND

An expanding data processing department in AMSTERDAM wishes to recruit U.K. expertise to strengthen their project teams developing a variety of commercial systems on IBM 370 equipment. The department is also responsible for implementing international systems and providing extensive user training in relevant areas.

## ANALYSTS

To £15,000

- \* GOOD EDUCATION
- \* 2 YEARS' PROGRAMMING
- \* 1 YEAR + IN ANALYSIS
- \* IMPLEMENTED ONE MAJOR SYSTEM
- \* FINANCIAL/ACCOUNTING EXPERIENCE

## PROGRAMMERS

To £10,000

- \* 2 YEARS' D.P.
- \* COBOL 1 YEAR +
- \* PREFERABLY IBM OS
- \* COMMERCIAL APPLICATIONS
- \* GOOD BASIC EDUCATION

Salaries will be commensurate with experience and FULL ACCOMMODATION will be provided during the first two years of employment.

Our client is renowned throughout the world for its products and is by far the market leader in a very specialised field. These vacancies offer U.K. personnel an exciting opportunity to enjoy the high standard of living in Amsterdam and be ideally situated for visiting other European countries.

REF. S1/3105/CW

## ANY COMMERCIAL LANGUAGE

N.W. LONDON c £7500

Exciting opportunities have arisen in our clients installation for experienced Senior Analyst/Programmers and Analyst/Programmers to play a major role in the company's continued expansion plans.

The installation comprises a medium range IBM computer and RPGII will be used for all the new systems to be developed, many of which will be on-line. Ideal applicants will be able to offer a minimum two years' business experience having used ANY COMMERCIAL LANGUAGE and possess the potential to progress within an expanding organisation.

Successful candidates will be given formal training where necessary, after which they will join teams developing sophisticated systems ranging from warehousing and distribution to management information using the latest techniques and equipment. For more experienced applicants opportunities exist to lead projects.

In addition to the career progression available a range of company benefits make these exceptional opportunities.

Ref. N1/3105

MYRIAD APPOINTMENTS LIMITED  
30 Fleet Street London EC4Y 1AA  
01-353 0981

## SENIOR SOFTWARE DEVELOPMENT PROGRAMMERS

NEAR WINDSOR c £9000

Two first-class career opportunities have now arisen within the U.K. division of an American based computer manufacturer, currently extending and enhancing software for its very successful range of computers.

The people appointed will be given responsibility for the development of software in one of the major product groups and will work in small self-motivating teams utilising on-line programming and dedicated hardware facilities.

Applicants will need to demonstrate a sound assembler level mainframe or mini computer background, ideally combined with data management methods and operating systems experience and should possess a progressive and innovative approach to software development.

In line with the very competitive starting salary the company is able to offer a very pleasant working environment and all the usual benefits associated with a successful business operation.

NWL/3105



# We're successful because our staff are

Data Logic operates at the forefront of computing, applying the very latest hardware and techniques to practical commercial problems. We cover the range from mainframes to the smallest computers. We are leaders in the use of microprocessors for applications that not so long ago required far larger machines.

Many of the systems we supply go far beyond providing extra speed and cost savings. They will revolutionise the way the user organisations operate. Several projects involve dispersed networks of ten or more minicomputers. Our largest turnkey system incorporates twenty-three machines and close to three hundred display terminals across the country — a totally new system which will serve almost every function within a leading company. A new police contract involves the first use in the UK of a mini for a complex data retrieval

application — with our own advanced methods for rapid, generalised record searches.

The exceptional scope and quality of work is important to our staff. We can match their individual experience to their projects. Equally, we can ensure that each project adds to their experience. As computing itself develops, so do they.

Over the past year Data Logic has grown dramatically in size, in scope of work and in reputation. Our expansion has meant unrivalled opportunities for career progression. We are not prepared to promote people before they are ready for it. But when they are ready — and we give all the assistance we can — the positions as senior programmer, senior analyst, project manager and consultant will be there waiting for them.

The reason is simple. We know that we are successful only if our staff are.

## Senior Software Staff

(Ref PS/01) For mainframe, minicomputer and mixed processor systems, usually supporting terminal networks. Increasingly Data Logic's turnkey projects involve minicomputers at multiple sites.

Applicants must have at least five years experience including some work in consultancy, system design or team management. Substantial knowledge is required of either high level language implementation on a leading mainframe or assembler language development on DEC, Data General or other leading minicomputers. We are especially interested in experience of:

- database systems
- distributed systems
- data communications
- telemetry
- operating systems design and implementation.

Salaries will be highly competitive and a company car is provided to staff at senior team leader level or above.

There are vacancies at our Greenford, Birmingham and Manchester offices.

## Programmers

(Ref PS/02) For both mainframe and minicomputer projects which include commercial applications, monitoring and control, and scientific analysis.

Applicants should have at least three years programming and/or analysis experience in high-level language or assembler on any leading mainframe or minicomputer.

This is an outstanding opportunity to gain experience in the development of complex high performance software. Our programmers work in small teams, taking considerable responsibility for distinct areas of the total system.

Salaries will be highly competitive. Vacancies exist at our Greenford, Birmingham and Manchester offices.

Write or call, quoting the appropriate reference number:

Kathy Martin  
Data Logic Limited  
29 Marylebone Road  
London NW1  
01-486 7288

A Raytheon Company

# Data Logic

**Open Day Central London 5th June**  
Words can only convey part of Data Logic's unique atmosphere. Meeting us will tell you far more. Come and discuss the opportunities we have for you at our open day at the Strand Palace Hotel, The Strand, W.C.2 on Thursday 5th June. We'll be there from 11.30 a.m. to 5.30 p.m. There will be drinks and light refreshments and the sessions will be informal.

# JBA

## GERMANY

### Operating Systems Specialists

£20,000 - £30,000

Several of our clients still seek operating systems expertise, preferably with a variety of machines, viz IBM, DEC, UNIVAC, CDC, etc. Work involves the design, program, test and installation of virtual machine operating systems and support software. The ability to design and implement software for an OS/MVS-type operating system is particularly desirable. Programming in assembler and high level operating systems languages. JBA would like to talk to anyone involved with operating systems, even post-graduates involved in research or similar.

Contact: Mike Creamer

### Prestel/Viewdata Specialists

from £20,000

Immediate vacancies exist for consultants who have considerable experience of information transmission systems, such as Prestel, Viewdata, etc. Data communications expertise and database knowledge is vital to the positions, particularly where concerned with large mainframes and front-end processors. A user contact background is desirable. Our client is one of the largest consultancy organisations in the world with over 3,000 employees. On this solid foundation, the company offer real up-market remuneration packages and excellent relocation assistance. Further, the prospects of continuation of projects at very senior levels in a worldwide market place is virtually second to none.

Contact: Mike Creamer

### Senior Systems Analyst

Hampshire

up to £8,400 + mortgage + benefits

This is a senior position combining project control and technical management of analysts and programmers engaged on vital work within a rapidly developing insurance company. With the installation of a database and TP system the position will offer tremendous opportunities for a senior analyst to diversify and expand technical experience. Applicants must be from a business COBOL applications environment, having preferably come up through the ranks to a leadership position, and be looking for a job with more responsibility and prospects. Immediate interviews will be arranged for suitable candidates. Tremendous employment and relocation package is offered, effectively increasing the base salary to a surprising level.

Contact: Mike Creamer

For further information on any of the above vacancies, please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

**JAMES BAKER ASSOCIATES, International Personnel Consultants,**  
16 Maddox Street, London W.1 Tel: 01-491 4478

## Communications & Control Systems

All Areas

c.£9,000

This client is fast building an unsurpassed reputation for the excellence of its technical ability and expertise in the development of advanced systems and software. They require a number of high-calibre technical staff to augment their team, in order to undertake the increasing volume of new orders for software development.

There is access to a wide range of mini and micro machines in-house, such as PDP11S, NOVA 3, HP1000, micro NOVA, INTEL and ZILOG, providing an ideal "workshop" for those who enjoy a hands-on environment.

Projects to be staffed full in to the following broad categories:-  
\* Message and line Switching \* Data Communications  
\* Command and control \* Automation

Ideal experience would be of Real-Time mini and micro environments and Assembler programming. Some knowledge of high level languages such as FORTRAN or CORAL is a distinct advantage. In general, however, drive, intelligence and adaptability are more important than specific machine technique or applications experience.

Contact: Margaret Stevens

## Communications Programmers

Berkshire

up to £7,500

We have been requested by our client, part of a well-known computer manufacturer, to recruit several programmers to participate in the development of communications and network systems. Applicants must have several years experience in programming with the last two spent implementing software for systems where data is being transmitted over a network. Knowledge of the standard protocols and switching techniques would be an added advantage.

Contact: Jim Baker

## Systems Analyst

Lake District

c.£8,800

We have been retained by a chemical processing organisation, a leader in high technology, to recruit a Systems Analyst to work on the development of technical d.p. applications. Candidates should have a good degree, preferably in the sciences, followed by about five years in a computer development environment. Since the work includes program specification a background of programming would be an asset. Current projects include the collection and analysis of specialised data, mainframe and mini-computer systems. This is a positive opportunity to live in delightful countryside and work on sophisticated applications. Excellent salary and benefits including relocation assistance and attractive allowances.

Contact: Jim Baker

We're looking for . . .

# FALMER Jeanius

Falmer Jeans is one of this country's most successful manufacturers of leisure wear, and as part of our continued programme of expansion we have the following vacancies in our newly-established computer department based in Rayleigh, Essex.

## 2 PROGRAMMER ANALYSTS

c.£5,000 p.a.

A Burroughs B1830 is currently being installed to handle all applications from Order Processing through Production Planning, Stock Control and Accounting. We now require two Programmers to design and implement the next phases of this development which will involve a considerable amount of liaison with user departments.

All systems will use the latest developments in on-line data base techniques using Cobol as the application language. Suitable experience in all these areas will naturally be an advantage.

## COMPUTER OPERATOR/ TRAINEE PROGRAMMER

c.£3,500 p.a. (No Shifts)

For this position we require a young person with the experience and technical ability to exploit the potential of a sophisticated on-line computer system. It is planned that full training on Burroughs hardware will be given, leading on to further courses covering Cobol programming and database techniques.

For further details contact:

Adrian Cubitt  
Telephone No: RAYLEIGH (0268) 773633  
Ext. 214  
Falmer Jeans Limited, Brook Road  
Rayleigh, Essex

## BURROUGHS

L9000

## OPERATOR

Required for leading West London Auctioneers and Estate Agents based in W.12. Salary negotiable.

Please contact Willmotts, 01-743 4444. Ref. TMHM for further details.

THE UNIVERSITY OF LEEDS  
DEPARTMENT OF  
CHEMICAL ENGINEERING

## REAL-TIME DATA ACQUISITION AND CONTROL

Applications are invited from suitably qualified candidates for the temporary post of RESEARCH OFFICER in the above Department. The Department is committed to the continued development of computer based methods for real-time work in teaching and research as well as in the design and construction of the University. A good deal of the activities up to now have been on microcomputers using computing equipment from Data General, Digital Equipment and IBM but it is envisaged that microprocessor based systems will feature heavily in the planned expansion. The appointment will be made with effect from 1 October 1979 for a fixed period of three years.

Salary at an appropriate point on the scale for Research and Academic Staff (£23,232-£71,455) under review, according to high qualifications and experience.

Application forms and further details may be obtained from the Registrar, The University of Leeds, 121 Park Road, Leeds LS2 9JT, enclosing reference number 121/79. Closing date for applications 6 July 1979.

## Computer Shift Operator for ICL System 10

for Pershke Price Service Organisation Limited, sole U.K. agents for many of the leading German print and print origination equipment manufacturers, including some of the latest computer controlled separation and photo-composition systems.

You will be working on your own on a shift system that does not include night work, operating our ICL System 10 which is used for a variety of applications.

Salary up to national average, excellent benefits including subsidised canteen and sports and social club.

For an application form just contact the Personnel Manager, Pershke Price Service Organisation Limited, Dover House, 141 Morden Road, Mitcham, Surrey CR4 4XB. Tel. 01-848 7080.

PPS

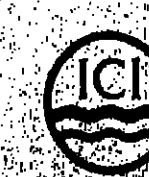
PERSHKE PRICE SERVICE ORGANISATION LIMITED

## Senior RJE Computer Operators

ICI are looking for two experienced RJE operators to work a two shift system in the busy computer terminal at Head Office.

The successful candidates will each be in charge of RJE operations on a large new CMC Sovereign System now being commissioned. This is an ideal opportunity for them to gain a detailed knowledge of equipment capable of communicating with a number of large IBM mainframe computers simultaneously and thereby enable them to become an integral part of a rapidly developing area of technology. It is essential that applicants should have relevant experience of operation

and transmission equipment and the ability to work under pressure in a service bureau environment. In exchange, we offer an excellent starting salary, shift disturbance allowance, profit sharing scheme, pension fund, recreation club facilities including squash courts, and a subsidised canteen.



For more information please apply to Miss Jane Nichols, Head Office Staff Section, ICI, IC House, Millbank, London SW1P 3JF or telephone 01-834 4444.

Open Day 1.5.79



## Analyst Programmers

**£22-28,000 pa**

The Howard Organisation is expanding its European software activities, particularly in the European sector, and requires several analyst/programmers with at least one year's experience of Interdata 32 (under O.S./32MT) and not less than 5 years' general Real-Time mini experience.

Qualifications to degree level are necessary. Successful applicants will be required to work in Germany for approximately 2 years and will enjoy very attractive employment conditions.

Contact Geoff King at the address below quoting Ref. GWK 180479 for full details or telephone 01-953 4066 (office hrs) or Aylesbury 630506 (7-9 pm. evenings).

### Advance - and be recognised

Howard Organisation International Ltd.,  
Employment Business Section,  
8 Elstree Way,  
Borehamwood, Herts.

**HOWARD**

Freelancers —  
Bet we surprise you  
with OUR "PACKAGE"

**VAG**  
the facts from....  
Vic Groves  
(Knutson) (0565) 52577  
(office hours)  
or (0565) 3122

### Computer Operator

£4210-£4634

To operate, on a 2-shift system, a 192K 1904S running under the GEORGE 3 operating system. He/she must have at least 18 months' experience, have common sense, initiative and a willingness to play a full part in operating present and future applications. In September 1979, the Authority will be taking delivery of a 2360/72 system operating under DME and VME/B. Conditions of service include 35-hour week, 22 days' annual leave plus 10 statutory days; staff restaurant; season-ticket scheme. Written applications, giving age, full details of education and career to date, to the Computer Services Manager, Computer Centre, Town Hall, London SW18 2PU by June 8.

LONDON BOROUGH OF  
**Wandsworth**

## Internal Consultant

**c£9000**

A major British manufacturing company achieving vigorous growth offers a practitioner, of the highest calibre, career entry solving business problems in the financial, marketing and production fields.

You must have achieved significant success in the practical application of O & M, Computer Design and/or Operational Research techniques either as a specialist or combined with other skills gained in line management. This will be allied to an intellectual capacity measured in academic terms by a good degree, possibly augmented by post-graduate studies. Your numerate qualifications and project leader capability should indicate management potential. Excellent conditions, in a 'blue chip' company with headquarters in the South, include help with relocation.

Men and women are invited to write, in confidence, under ref: 1566/ALD/CW detailing age, qualifications and relevant experience to:-

**Robert Lee**  
International  
24 BERKELEY SQUARE, LONDON W1X 3AR

## McDowell, Knaggs

COMPUTER RECRUITMENT, TRAINING AND CONSULTANCY  
**SCIENTIFIC, TECHNICAL & ENGINEERING DISCIPLINES**  
SALARY RANGE £4000 p.a. - £7500 p.a.

For installations in GLOUCESTERSHIRE, WORCESTERSHIRE and the W. MIDLANDS require staff for Computer Systems Design, Hardware Design and Modification, Modelling, Simulation, etc., on the following types of applications: Rocket propulsion, aircraft head up/head down displays, computer typesetting, circuit board layout design and analysis, aircraft weapons systems, C.A.D., gas turbine engines, automatic test equipment, computer aided engineering digital control systems, airborne applications and micro-processor techniques.

Candidates should ideally have a numerate degree or equivalent, but the right attitude, personality and type of background is more important. They should in addition have the capability of solving technical problems (involving design and programming), be self-motivating and have the desire to work in a challenging, informal environment as a member of a small compact project team on site of the art technology — including micros.

Languages used include FORTRAN, BASIC and Assembler and the Hardware includes PDP, PRIME, GEC, D.G., ZILQ and T.I.

If you would like to work in any of these geographic locations and your qualifications and ambitions are suited to the above then please contact Don Knaggs on Worcester 427077 (Bewdley 400036 evenings and weekends) or write to THE MOUNT, 1 ST. JOHN'S, WORCESTER.

### OXFORD POLYTECHNIC

Computer Centre

**PROGRAMMERS**  
(Salary £3732-£5073)

A number of new posts for Programmers have been created in the Computer Centre of Oxford Polytechnic.

At present the Centre's main computer is an ICL 1903T, running MAXIMOP and GEORGE 2, but a major new interactive system will shortly be ordered for delivery during Summer '79. The two most commonly used programming languages are FORTRAN and COBOL. There are, however, many students and staff wishing to use or experiment with all the newer high level languages. We are looking for both systems and applications Programmers to work in most of the 15 departments, and in support of the administration. If you feel capable of working in this demanding environment using your skills to help others, write for further details to:-

The Deputy  
Administrator  
Oxford Polytechnic  
Oxford OX3 0BP

### SITUATIONS WANTED

**PROJECT MANAGER/  
BUSINESS ANALYST**  
10 years' experience in computer systems studies (industrial, commercial and financial systems), and implementation. Bilingual English/German. New graduate from Vienna, offers challenging new opportunities in W. Europe. For 1981 Computer Weekly

**Baric**  
Where your  
career develops  
as fast as your  
skills



Baric is already one of Britain's largest computer bureaux, providing a fast and efficient service to commerce and industry. Being jointly owned by ICL and Barclays Bank, we have the resources we need to make sure our current expansion plans are a continued success.

As an experienced Operator, male or female, you could have a major part to play in our future. At present we have two 1904S's and 1904A, a 1902T and a 2970, and in addition we are introducing exciting new developments like our DATACARE system of terminal based distributed processing.

### Shift Leader

**£5,000-£6,000 + 41% shift allowance**

You will have had at least five years experience of shift management gained ideally in a commercial multimachine environment. You should be completely familiar with GEORGE 3 and/or 2900 equipment under VMEB, and have experience of COMMS, and preferably of working with a bureau.

### Senior Operators

**£3,500-£4,400 + 41% shift allowance**

You should have had at least two years experience, including GEORGE 2, GEORGE 3, or VMEB. Familiarity with COMMS is essential.

### Operators

**£2,800-£3,700 + 41% shift allowance**

If you are familiar with the operation of ICL equipment we can offer you excellent prospects and a real chance to develop your experience.

The excellent salaries are substantially increased by the allowance which is currently under review payable for working our four-shift system, which allows us to give 24-hour, 7 days a week service.

Prospects within our growing organisation are excellent, and your career progression should be as rapid as the development of your skills.

To find out more contact Peter Strode, Baric Computing Services Limited, Forest Road, Feltham, Middlesex. 01-890 1414.



## Internal Consultants

Computer Systems Audit/Security  
London based, to £10,500 + car

These vacancies arise through promotions within a function recognised as providing excellent and varied prospects of career advancement. Our client is a multinational manufacturer and distributor of business equipment and supplies. Successful candidates will be members of an internal consultancy team providing international management at all levels with a professional appraisal of operations methods

and an assurance of the integrity of current systems. Candidates, probably 27-35, must be graduates with at least 3 years in EDP systems management, ideally with IBM equipment. A full understanding of business problems associated with large scale systems development is vital. For one of the vacancies experience of security technology is preferred. There is about 30% travel, mainly overseas.

N.P.S. Lilley, Ref: 22134/CW.

Male or female candidates should telephone in confidence for a Personal History Form to:  
LONDON: 01-734 6852, Sutherland House, 5/6 Argill Street, W1E 6EZ.

**Hoggett Bowers**  
Executive Selection Consultants

BIRMINGHAM, CARDIFF, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE and SHEFFIELD.



HELLA AUTOMOBILE EQUIPMENT LTD.  
BANBURY, NORTH OXON

### 'PROBLEM SOLVING' PROGRAMMER

For an initial 12 months contract, we require the services of a PROGRAMMER, TRAINED IN ASSEMBLER LANGUAGE, to take responsibility for the running and control of the administrative systems, currently programmed on to our Hindor 300S equipment. This post could suit someone keen to start or develop their managerial experience.

Over probation the post is open move.

We have a very open mind on salary level. Please advise your assessment of the position's worth.

For more details, please contact initially to Mr. J. H. HOGGETT (Agency), on 0295 53449/53440, or write to: 73/74 St. Paul's, Banbury OXON (Telex No. 52/4/3742)

**COMPUTER PERSONNEL APPOINTMENTS LTD.**  
Career Specialists and Consultants for  
**D.P. MANAGERS, SYSTEMS ANALYSTS,  
PROGRAMMERS AND OPERATORS**

For application forms apply to:-  
65 New Street, Birmingham B2 4DU. 021-643 0951  
or Tel 01-328 7251

Northampton Borough Council  
Finance Department

### Senior Systems Analyst

**S01/2 - £5232-£8060 p.a.  
(inclusive of supplement)**

Applicants for this challenging and interesting post should have approximately 3 years' experience in Systems Analysis and be capable of undertaking new projects from beginning to end.

The Council operates an ICL 64K 1902T Computer with disc and tape backing, on-line video and cash receipting terminals and key-out magnetic tape input. The communications network is in process of expansion. Starting salary will be commensurate with qualifications and experience.

Temporary lodging or travelling expenses: disturbance allowance; assistance with removal expenses and estate agents' solicitors' fees in approved cases. Housing accommodation may be available.

Application forms are available from the Chief Executive and Town Clerk (Personnel), Northampton Borough Council, 81 Dergate, Northampton NN1 1UV. Telephone Northampton (0404) 34581, Ext. 583. Completed forms to be returned by not later than June 11th, 1979.

## Success creates new opportunities in Sales & Service

Modcomp is one of Europe's leading suppliers of mini computer equipment, particularly in the industrial process control and communications field. Over the last eighteen months, we have doubled our installed client base, introduced new product lines and established manufacturing and software development in the U.K. We have ambitious plans for continuous growth over the next eighteen months and need the following key people to join us in achieving this.

### European Service Manager

Extension of the European organisation and resultant internal reorganisation has created a requirement for a senior manager within our European Customer Service Division. This is a key position requiring a strong manager capable of establishing operating procedures and reporting mechanisms to run a multi-million pound field service organisation. This involves local field service, national support, depot repair and customer service acceptance activities across several European countries. The role will be working from a base but will involve some travel to Europe and our headquarters in Florida. Ideal candidates will probably already be experienced in running a field service organisation in a systems house or manufacturer of processors or peripherals. Essential he/she must have the potential to grow with the organisation.

### Sales Manager, Scandinavia

Modcomp intends to establish a direct sales operation in Sweden during 1979. We need a highly competent Sales Manager to be actively involved in setting up the new office and to spearhead the expansion of our existing sales market. This involves the support and development of existing OEM's as well as the identification of new OEM and major end-users throughout Sweden, Finland and Denmark. Essentially this individual will be a sound business person well able to demonstrate a successful track record of sales management in the mini computer market, particularly in Scandinavia. Fluency is required in Swedish as well as a good grasp of English and a willingness to relocate, if necessary, to the Stockholm area.

### Service Manager, Scandinavia

Increased sales activity, increased client base, means we need a Customer Service Manager to work closely with the Sales Manager to ensure a successful operation in Scandinavia. Specifically he will be responsible for the development and organisation of all service department functions, both hardware and software. This will also involve determining terms of business for marketing service department activities, establishing reporting procedures and developing training programmes for clients and own staff. This individual must be capable of working on own initiative and currently will already hold a senior supervisory role in a field service environment. He/she will be familiar with processors, controllers (as peripherals, either mainframe or mini). Again fluency is required in Swedish and a working knowledge of English; also should be prepared to move to the Stockholm area.

Company benefits are excellent for all these roles including competitive salary and company car. For application form or further details contact ANNE CAMPBELL on 0734 788711 or send detailed resume to MODCOMP, MOLLY MILLARS LANE, WOKINGHAM, BERKSHIRE.

**MODCOMP**



# Real-Time Mini + Micro

Our client, a major International Corporation, has openings in several of their U.K. and E.E.C. offices, including Central and Greater London, Hants, Cheshire, Holland, Denmark and Germany. In particular they are seeking Senior Analysts and Programmers, Project and Team Leaders and Systems Designers to work on projects including: Process Control, Communications, Military systems, Modelling, Simulation etc.

Ideally your hardware experience will embrace either PDP11, D.G., Interdata, Intel 8080, Zilog Z80 or M6800 and your languages include Assembler with either Coral 66, Pascal, Basic, Fortran etc.

Whilst a degree in Computer Science or equivalent would be advantageous, emphasis will be placed firmly on depth-of-experience and potential.

A full benefits package will be offered to complement a very attractive salary (overseas up to 60% higher) and many positions qualify for a car. Expect to negotiate around:

**£6.5-10K  
+ Car**



Avon House,  
360 Oxford St.,  
London. W1N 9HA.  
Tel: 01-491 4636  
Telex: 28800 Londof G.

## datascene

### SALES CONSULTANT JOIN OUR PROGRESSIVE CONTRACTS DIVISION

THE AREA OF DATA PROCESSING YOU ARE CURRENTLY WORKING IN IS NOT AS IMPORTANT AS SALES EXPERIENCE OR THE ABILITY TO SUCCEED IN A SALES ENVIRONMENT.

THE CONTRACT MARKET IS HARD AND HIGHLY COMPETITIVE. YOU WILL NEED TO BE RESILIENT, RESOURCEFUL AND EXTREMELY SELF-MOTIVATED.

IN RETURN WE WILL OFFER YOU RELEVANT TRAINING AND SUPPORT, AN ATTRACTIVE SALARY PACKAGE, PLUS A COMPANY CAR, AND AN OPPORTUNITY TO DEVELOP YOUR OWN AREA WITHIN OUR FAST EXPANDING ORGANISATION.

WE WANT A WINNER, NOT A SURVIVOR, SO IF YOU HAVE THE CONFIDENCE TO SWOP YOUR JOB FOR A CAREER,

TELEPHONE OR WRITE TO

**BOB EDWARDS, CONTRACTS MANAGER,**  
QUOTING REFERENCE NO. D1/007.

Datascene Recruitment Limited  
Scotby House  
355-373 Victoria Street  
London W1R 7PB  
**01-439 7871**  
24 hour answer phone

## SUB-EDITOR

Electron, the weekly magazine for the UK electronics and electronics user industries requires a sub-editor.

We are looking for someone who can edit and layout copy at a fast pace.

Ideally, applicants will already have some journalistic experience on a technical publication. However those currently working in electronics who wish to break into publishing will be considered.

**Salary up to £4,900 and £210 reading allowance.**

Telephone or write to Barrie Nicholson, for an application form: Electron, 79/80 Blackfriars Road, London SE1 8HN. Tel: 261 9111.



### SYSTEMS ANALYST c.£6,500

E. Gomme Limited, who manufacture G-Plan furniture, have a vacancy for a Systems Analyst in their IBM 370/125 installation.

Applicants should have several years' data processing experience, with at least 1 year spent in systems analysis, ideally in a manufacturing environment.

The successful applicant will play an important part in the design and implementation of a wide variety of new applications, both batch and T.P., as well as being involved in the development of existing systems.

Conditions of service are very good. Relocation expenses will be reimbursed where appropriate.

Please write to: Mr A. Sampson, Company Personnel Manager, E. Gomme Limited, Spring Gardens, High Wycombe, Bucks.  
Tel: High Wycombe (0494) 28250

## HERTFORDSHIRE COUNTY COUNCIL

The opportunity has arisen for Data Processing professionals to join our computer team currently involved in an ambitious programme of systems design and development. Candidates should be enthusiastic, imaginative, drive and ability to achieve objectives within prescribed time-scales.

The installation comprises a 1M byte NCR Citron 800 providing virtual storage under VAX operating system and interactive program development. Current developments include a major on-line stock control system and the installation of mini-computers as part of a planned distributed processing network.

The posts to be filled are —

### PROJECT LEADER

salary £7,164-£7,908 inclusive (ref: CP.4)

Applicants should have a sound knowledge of computer projects from feasibility study to implementation stage. At least one year's experience of leading a team of developers is required. Experience in project control and evidence of the successful implementation of at least one major project is essential for this key post.

### SENIOR SYSTEMS ANALYST

salary £6,633-£7,350 inclusive (ref: CP.5)

Applicants should have at least three years' systems experience, preferably on commercial applications. A programming background would be considered to be advantageous.

### CHIEF OPERATOR

salary £5,847-£6,180 inclusive (ref: CP.6)

In addition to the responsibility for the co-ordination and administration of the two shifts of operations staff, the role includes a rapidly developing technical support function for operations area. Applicants for this post should have extensive operations experience of NCR main-frame computer and a general knowledge of telecommunications equipment, mini-computers and operations support activities. A help approach and an ability to learn new techniques are considered to be essential for this post.

Generous holidays, a contributory pension scheme with a wide range of benefits. Ideal working conditions, new office staff restaurant, in an attractive rural setting overlooking County Town of Hertford, a range of sporting facilities within easy reach of London's many amenities.

Removal, disturbance and lodging allowances are payable in approved circumstances and assistance with housing may be given.



Applications (no forms) giving details of experience, age, qualifications etc., to the County Treasurer, County Hall, Hertford, quoting appropriate reference, by Friday, 11 June.

## VERNON'S ORGANISATION

### have vacancies for PROGRAMMERS- MINI COMPUTER

To join the team involved in the application of software in the Electronic Data Processing Department in our Aintree Branch.

Applicants should have —

★ MINI COMPUTER EXPERIENCE including assembler programming Language.

★ A sound understanding of computer hardware.

★ Peripheral driver, writing experience.

★ A good ENGINEERING/SCIENTIFIC BACKGROUND

★ The ability to function efficiently under pressure with minimum supervision.

We are offering an attractive starting salary together with contributory pension, life assurance scheme, BUPA and four weeks holiday each year's service.

Apply in writing to the —

Personnel Manager  
Vernon's Organisation Limited  
Ormskirk Road,  
Aintree,  
Liverpool L6B 1AA

# When we call someone a manager it isn't just a title. We mean it.

Data Logic's Professional Services Division is one of the country's leading software groups. We advise on feasibility, develop software and supply total systems. We cover the range from mainframes to the smallest computers. Several of our projects involve dispersed networks of ten or more minicomputers. Our largest has twenty-three machines and nearly three hundred displays.

Our line managers are responsible, within their defined areas, for sales, for projects and for staff. When we say they are responsible, we mean it. There are sales and profits targets, software quality standards to be met, and project deadlines. There are clients who look to the manager and his teams as experts — often the experts — in their fields. And our

managers have considerable autonomy in planning and implementing the future development of their departments.

We want to meet men and women with the experience and ambition to join our successful management team. We know that there aren't many of you. You will have sales or management experience in a software or systems company. You will be technically on top of, and thoroughly up to date in, your field. You will have the confidence that you are ready to take on the demanding role we describe.

We are especially interested in knowledge of applications in banking, finance, commerce, industry and the public sector. There are opportunities in both the London area and the

North of England.

Rewards will be high, with salary well into five figures, a company car and other benefits. As to the future, we plan to more than double turnover in the next five years. So the prospects for our managers will be outstanding... perhaps even unrivalled by any other UK systems company.

**Data  
Logic**

Interested? Then write  
or call quoting  
reference PS/04:  
Kathy Martin  
Data Logic Limited  
29 Marylebone Road  
London NW1  
01-486 7288

A Raytheon Company

## BROADEN YOUR HORIZONS! TRAINING IN EUROPE AND U.S.A.

**SALES EXECUTIVES** **£12,000**  
Generous Basic Salary + 80% Quota Earnings Guarantee + Commission + Prestige Car + Extensive Training (U.K., U.S.A., Europe)

**SYSTEMS SUPPORT EXECUTIVES** **£7,000-£8,000 +**  
Prestige Car + Expenses + Bonus + Extensive Training (U.K., U.S.A., Europe)

Our client is one of the most respected computer manufacturers in the World with over 20,000 installations and Group Sales Exceeding \$1 Billion. They offer an Extensive Range of High Performance Systems including:

Small Business Systems  
Real Time Minis  
Distributed Processing Networks  
Terminals etc.

Supported from 8 Separate locations  
with 2 Customer Training Centres  
and Further locations currently being planned

Currently all their Salesforce is Exceeding Objectives and to maintain their growth rate in the U.K. they need to make further investment in PEOPLE... YOU!  
1979 Development will take place throughout the U.K. from bases in London, Birmingham, Manchester, Leeds, Edinburgh and Dublin. (Some of these being future plans.)

In addition to all the above benefits you will enjoy:

Profit Sharing Scheme  
Subsided B.U.P.A.  
Christmas Bonus

PLUS — One of the Finest Sales/Product Training Schemes Available in the Industry Today!  
So, if you have, or are looking for, Sales or Support experience and feel you are ready for the challenge of a Stimulating Dynamic Environment with REAL PROSPECTS for FUTURE MANAGEMENT then Call Now for Immediate Interview.  
Ref. C.S. 1148.

**db executive (kingston) ltd**

59 EDEN STREET, KINGSTON UPON THAMES, SURREY KT1 1BW  
TELEPHONE: 01-549 6441-9

## INTERNATIONAL AMERICAN BANK COMPUTER AUDIT

We are a major American Bank, long established in London. Presently we are expanding our activities considerably Worldwide and particularly in Europe.

Large data processing projects are currently being developed and more are planned in London, Europe and the Far East. The equipment is mainly IBM 370 and IBM System 3/32/34.

As a result of this expansion, the International Audit Department wish to recruit a young man or woman, to join the Computer Audit team. The position will suit a self-motivated programmer, in their mid-twenties with at least 2 years' experience of COBOL Programming under DOS/VS (preferably in a banking environment), who wishes to develop their career by moving into the fast expanding field of Computer Auditing.

The post affords the opportunity of working with various Computer Systems, both in London and Overseas, and offers excellent training to keep the candidate at the forefront of Computer technology.

Generous fringe benefits include:

- ★ Low interest mortgage and personal loan facilities
- ★ Free lunches, BUPA contribution and life assurance
- ★ Interest-free season ticket loan
- ★ Profit sharing
- ★ Non-contributory pension scheme

For further information please write or telephone Richard Newcombe, Manufacturers Hanover Trust Company, International Audit, 27, 28, Curator Street, London, EC4P 4BB. Telephone: 01-405 1955

Copy to 10/15/79









# Programmer/Analysts

## ANALYST PROGRAMMERS

**C £6,500** **S.E.1**  
Feel like travelling worldwide? A major business forms manufacturer with international associate companies requires an alert RPGII programmer to help install exciting new systems on an IBM System 34 computer. Applications you will work on include sales and marketing, stock control, order processing, fixed assets and financial systems. Candidates should have at least 2 years' computing experience and be prepared to travel. There could also eventually be the chance to learn the latest RPGIII language. Large company benefits apply and there are excellent prospects for promotion.  
CW 22/3 MICHAEL

## CONSULTANTS

**C £7,000 + PROFIT SHARING + CAR** **C. LONDON**  
A small but active software house based in SW London needs 3 systems analysts for the following major applications. The first analyst needs to have ICL 2903/4 or 1900 GII experience of 4 years or more, to work on a major financial application. The second needs to know the 2960 machine as this involves an interesting MIS conversion and upgrade from an existing ICL 1900. The third consultant should have stock or production control experience for an ICL 2900 under VMEB, using TP and IDMS. All three vacancies offer attractive working conditions including 4 weeks' holidays and 8 months' sick pay.  
CW 22/2 MICHAEL

## PROGRAMMER/ANALYST

**C £6,000** **CROYDON**  
Our clients are an international foreign insurance company with the majority of their systems being financially oriented. IBM COBOL people should apply and especially those who would like the opportunity to learn MKIV. Although the installation is not large the work is very varied and interesting, and demands a high degree of professionalism. Excellent shopping area nearby and the usual large company perks.  
CW 22/3 MICHAEL

## ANALYST PROGRAMMERS

**TO £6,500** **S.E.1**  
Being a specialist Service Bureau our client's future is assured, so why not join them and make sure your future is as safe? They specialise in legal work and provide on line and batch facilities from their up-to-date DEC installation. If you have 2 years' BASIC+ experience and enjoy working for a progressive organisation then apply now. Company benefits include C.P.S., Life Assurance and 4 weeks' holidays.  
CW 22/4 MICHAEL

## CUSTOMER SYSTEMS SUPPORT

**C £8,500 + CAR** **C. LONDON**  
This major international terminal and mini manufacturer requires three first-rate Systems Analysts to advise, design and install a variety of Real Time applications based around Mini or O.E.M. Mainframe Computers. Excellent opportunity for advancement and top company perks.  
CW 22/5 MICHAEL

## SYSTEM 10 PROGRAMMERS

**£4,800 to £6,300 + O/T** **SLOUGH**  
Do you have System 10 experience and wish to use it, but also wish to broaden your knowledge to include IBM equipment? If so then apply to join our client's company, an important distributor of industrial appliances. They have a major IBM DOS/VS installation plus a connected network of System 10s around the country for on-line distributed processing work. Excellent company perks include paid overtime, relocation expenses, flexitime, non-C.P.S., subsidised canteen and 4 weeks' holidays. You really can't afford to miss this golden opportunity.  
CW 22/6 MICHAEL

## ANALYST PROGRAMMERS

**£4,500 to £6,000** **NR. HEATHROW AIRPORT**  
Are you a COBOL or PLI programmer with about 2 years' experience, anxious to get into analysis work but frustrated? Apply to this major consumer product company and they will train you accordingly and make your career really worthwhile. They have an IBM DOS/VS installation using on line CICS systems and work will be on a number of sophisticated commercial systems. Top company perks include 4 weeks' holidays, subsidised canteen, annual bonus scheme and a free local bus service.  
CW 22/7 MICHAEL

## PROJECT LEADER

**TO £8,000** **NR. BEDFORD**  
With a lovely area to live in, pay and working conditions at the top end of the bracket, this surely must be the right move for you. You just need 5 years or more DP experience as an analyst or programmer based around IBM equipment (using COBOL or PLI) with a preferred O&M background. You should also have the ability to lead a small team working on advanced IBM OS/VS1 CICS systems. Top perks include relocation expenses, flexitime, C.P.S., subsidised canteen and 4 weeks' holidays. Project leader types please apply now.  
CW 22/8 MICHAEL

## PROGRAMMER/ANALYST

**£8,500 to £12,000** **CENTRAL LONDON**  
Six large, well-established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require first-rate service. Technical Communications Consultants are also required where in-depth implementation experience of IBM or DEC latest ranges are essential. Excellent fringe benefits and prospects.  
CW 22/1 MICHAEL

## ANALYST PROGRAMMERS

**C £6,000** **ESSEX**  
A major industrial office product organisation is looking for programmers who wish to progress into analysis, or analyst programmers with 1½ years' IBM COBOL experience. This company has exciting application areas to work on, including a major sales accounting and order processing system where teleprocessing and Database techniques will be used on their IBM DOS/VS installation, which include 70 VDU's. Excellent training, nice new building and company benefits will be provided. Please apply quickly.  
CW 22/10 MICHAEL

## FORWARDED TO: PROGRAMMERS

| UK     | TO £300 per week          | Brighton   | 2 months |
|--------|---------------------------|------------|----------|
| ICL    | To 2960 Conversion        | S. Coast   | 0 months |
| IBM    | Valuation S/A             | S. Coast   | 0 months |
| IBM    | PLI CICS                  | C. London  | 0 months |
| IBM    | Mark IV                   | Herts      | 2 months |
| IBM    | Rova Assembler            |            |          |
| IBM    | Overseas to £450 per week | N. America | 0 months |
| IBM    | COBOL                     | Germany    | 0 months |
| IBM    | MVS Syst. Prog.           | Paris      | 1 year   |
| DEC    | Macro 11/RSX11            | Brussels   | 0 months |
| SINBER | Syst. 10 Assembler        | Kovell     | 1 year   |
| IBM    | COBOL/Assembler           |            |          |

Ring Irene on 01-985 4148 for more vacancies



Recruitment Consultants  
**UNIVERSAL COMPUTER ASSOCIATES LIMITED**

01995 3883 (01958 6138 Evenings)

Data Express House, 3 Prospect Place, Heathfield Terrace, Chiswick W4

## ADVANCED TECHNOLOGY SOFTWARE DESIGN

★ DESIGNERS ★

SENIOR DESIGNERS



PROJECT LEADERS

£6,500 P.A. TO £9,000 P.A.

One of the World leaders in the field of Telecommunications can offer experienced Software designers the opportunity of joining teams working on the most advanced Telecommunications system in the industry. At Project Leader level candidates will be able to make an immediate contribution based on 4-5 years' solid experience in Control Software and preferably a knowledge of Telecommunications systems. There are, however, opportunities at all levels and if you have any experience of real-time Software Design or High Level languages we strongly recommend that you contact us to discuss these openings.

The teams will be based WEST of LONDON in RURAL BERKSHIRE. The working environment at the Self-contained Research and Development centre is exceptionally good, and there is a very generous RELOCATION PACKAGE available to all candidates together with the usual large company benefits.

## CURRENT PROJECTS

- ★ OPERATING SYSTEMS
- ★ COMPILERS
- ★ SIMULATION
- ★ TELECOMMUNICATIONS SOFTWARE

CORAL is the main software tool but FORTRAN, ALGOL or ASSEMBLER experience is useful.

## CAREER PACKAGE

- ★ REMUNERATION — These salary levels are realistic and negotiable on experience and potential.
- ★ PROSPECTS — The pace of development is such that having proved your ability, the positions of responsibility will find YOU.

★ EXPERIENCE — Quite simply, involvement in this nationwide project will put you at the head of your field.

★ TRAINING — In depth, on and off the job.

**Contact: ROLAND JONES**  
**on 01-603 7335. Ref. RJ 1168**  
**Or write to Information Processing People**  
**Freepost**  
**London W8 6BR**



**Information Processing People**

58 Pembroke Road, London W8. Telephone: 01-603 7335/6. Telex: 261298  
Computer Services & Recruitment Consultants

## We have moved to VICTORIA

## Central Computing Consultants

8 Lower Grosvenor Place, London SW1 Telex 27950 Ref. 1035

Telephone  
**01-834 7105**

## MICRO PROCESSING

Germany

Up to £17,500 + benefit

Opportunities have arisen with our client to combine a move to Germany and work on a micro-processing development.

Candidates with experiences of INTEL 8080 or similar will enjoy a rewarding career developing micro systems for test and installation equipment. Experience of PLM would be advantageous.

Successful candidates must have the ability to speak standard German. Our client offers generous salaries plus many fringe benefits.

CW 22/1

## MAINFRAME COBOL

London

£7,000 + bonus

Experience of COBOL is the more immediate requirement needed by our client, an international software house, today.

Fortunately, our client being one of the oldest and most respected companies in the industry can and do offer a lot more than the majority of their competitors. These benefits range from genuine career progression to Project responsibility. Salaries + Bonuses are related to one's contribution to the company, and there is the prospect of interesting assignments in the U.K. and overseas.

As mentioned above, we seek candidates with COBOL experience, but due to the overall business base being spread over all the traditional mainframes our client can and will offer interesting and well paid (up to £7,000 + bonus p.a.) job opportunities to programmers with 2 years or more COBOL on any machine.

CW 22/3

## OPPORTUNITIES IN EUROPE

ATTRACTIVE SALARIES

1. TECHNICAL WRITERS
2. CAD/CAM — MECHANICAL ENG
3. IBM SYSTEMS PROG
4. INTEL 8080/8085
5. PROCESS CONTROL Software
6. SIEMENS 330 Software
7. DL1/CICS
8. RTL 2 PROCESS CONTROL

SWITZERLAND  
HOLLAND  
FRANCE  
GERMANY  
SWITZERLAND  
GERMANY  
HOLLAND  
GERMANY

Candidates interested in a move to the Continent with the above or similar experience, should contact us to discuss these opportunities.  
CW 22/5

## SOUTH COAST OF IRELAND

Senior Programmer

£ neg.

A manufacturing company in the south of Ireland wishes to recruit a senior programmer to join its development team. The position involves supervision of a group of programmers and the development of manufacturing and commercial systems.

Candidates should have several years' DP experience and a knowledge of IBM equipment is desirable.

The position carries a competitive salary, which will not prove a limiting factor to the right applicant, and the benefits are those normally associated with a large company.

For further information telephone Jim Corrigan on Dublin (0001) 789577 or write to CCC at Cranmore, 65 Glen Road, Belfast BT11 8BD.

CW 22/7

## PRODUCT SPECIALISTS

Middlesex

Up to £7,500 + car

One of the most dynamic companies marketing computer equipment today, is recruiting two additional support consultants to introduce new product lines. These products are centred around word processing and portable DATA ENTRY equipment.

Candidates should have an academic qualification in a computer-related subject. Suitable backgrounds will include experience in both hardware and software in a support, service or design environment.

These positions include pre- and post-sales support for these new product lines and include the evaluation and introduction of the products to the worldwide network of distributors.

The Company offer one of the most rewarding career opportunities within a dedicated and committed marketing and support operation in the UK and Europe.

CW 22/2

## HONEYWELL

N.W.3

c £6,000

Our clients, a National Transport organisation who have their Head Office in Swiss Cottage, have a vacancy for a JUNIOR ANALYST or PROGRAMMER who would like to move over to Analysis.

Their installation is a Honeywell 66/40 running under GCOS and using TDS/IDS. The successful candidate will initially train and gain experience by working with a Contract Analyst, but you will eventually be providing the base of future analytical requirements. It is envisaged that the person selected will eventually become the Senior Analyst.

Ideally, the person we are looking for will be of Degree standard, would either have had programming experience (Cobol on Honeywell Hardware) and some analysis, or a Programmer/Analyst who wishes to become a full-time Analyst.

CW 22/4

## SYSTEMS AND PROGRAMMING

London

Up to £8,500 p.a.

A major international service company based in LONDON has a need for experienced PROGRAMMING AND SYSTEM staff to assist them with their planned expansion:—

The installation is an IBM 370/158 running under MVS, and using CICS and IDMS.

Their main requirements are for SYSTEMS ANALYSTS with at least 2 years' Systems Design experience in any of the following areas:—

TELEPROCESSING, REAL-TIME SYSTEMS, DATABASE

They also have vacancies for PROGRAMMERS at all levels, the minimum requirement being two years' experience of programming in PL1 and/or Assembler on IBM equipment, within a project team environment.

In addition to earning attractive salaries, the successful applicants will be offered all the benefits usually associated with a large company.

CW 22/6

## MOVE INTO MICROS

Berkshire

A small systems company based in Bracknell, is in the process of expanding its operation and consequently is able to offer unique opportunities to enter the microprocessing side of computing.

The company now requires graduates with a good all-round knowledge of programming and systems design, and experience of FORTRAN and/or an assembly-level language to assist them with their development of specialised systems for the graphic arts industry and the legal profession, which are based on Data General hardware. They would also like to hear from Engineering graduates who have experience in logic and systems design, with a knowledge of systems debugging using assembler.

Successful applicants will be offered an above average salary as well as the opportunity of working on stimulating projects for a dynamic young company, where results are well rewarded.

CW 22/8





Specialists since 1971 in UK and International computer appointments. We have many other jobs on our files and offer a career counselling service to computer professionals.

## SURREY EUROPE

RAND  
INFORMATION  
SYSTEMS LTD.



Our clients offer data processing services to clients throughout the world. Their corporate offices are in San Francisco with established companies in the UK, France, Israel and Australia. For over 10 years they have consolidated their reputation as specialists in conversion systems; they are also entering other areas in the computer market and wish to recruit a number of computer professionals to meet their expansion plans.

**Cobol Programmers**  
**£4,500 – £7,000**

**Technical Consultants**  
**£7,000 – £9,000**

We are looking for high calibre Programmers and Technical Consultants with a minimum of two years solid COBOL programming experience on Honeywell, IBM and/or UNIVAC systems.

More experienced candidates should offer a sound working knowledge of OPERATING SYSTEMS (GCOS for HONEYWELL), TRANSACTION PROCESSING, DATABASE (especially for Univac 1100), or a specialist knowledge of IBM.

All positions are permanently based in the UK with overseas assignments offering an opportunity to travel or to work abroad in the case of longer projects. Current projects are in progress in the UK and FRANCE with prospects in HOLLAND and GERMANY.

Competitive starting salaries will be negotiated within the range £4,500 - £9,000, taking into account qualifications and experience. The package will also offer generous fringe benefits. *Ref: 514/CW/RN.*

(Et si en plus de cela, vous parlez français, et bien raison de plus pour ne pas hésiter!)

Please ring Renée Nute for further information - day 01-242 9356, evenings and weekends 01-874 6372.

Our offices will be open until 7.30 p.m. on the 4th and 5th June for informal discussions with our clients representatives and our consultants.

OCC Computer Personnel Limited, 16 Bedford Row, London WC1R 4EB



## ANALYST PROGRAMMER

Swindon

£6,500 + benefits

Are you ready to move into Systems Analysis?

Training provided with involvement from design through to implementation.

CONTACT BOBBIE McCORMICK NOW  
ON 01-603 7335



Information Processing People  
58 Pembroke Road, London W8A 7BQ Telephone 01-603 7335 & Telex 261298  
Computer Services & Recruitment Consultants

## OPPORTUNITY to become a COMPUTER STATIONERY REPRESENTATIVE

with a leading Croydon based company  
You must have enthusiasm for computers and experience in selling to middle management  
Your area will be Norfolk, Suffolk, Cambridge and Bedford.  
In return you will receive a good salary, commission and bonuses, a company car and four weeks' holiday. Plus the benefits of a non-contributory pension scheme and two bedroom company flat with service agreement within your territory.  
Apply in writing to:  
Mr. M. J. Soper  
Managing Director  
SCS BUSINESS SYSTEMS LTD.  
305 Melton, 77 Milton Road  
Croydon, Surrey

## UNIVERSITY OF MANCHESTER LECTURERS IN COMPUTER SCIENCE

Applications are invited for the above posts from candidates possessing good Honours Degrees in Computer Science, or a related discipline, who have had research or industrial experience in Systems Software, Information Processing, Applications or Industrial Applications. The successful candidates will be expected to undertake teaching at both undergraduate and postgraduate levels and to contribute to the Research of the Department into the design and performance of application orientated computer systems. Posts tenable from October 1st, 1979 or a date to be arranged. Initial salary within the range: £4,232-£9,048 p.a. from October 1st, 1979. Superannuation.  
Further particulars and application forms (returnable by June 28th) from the Registrar, The University, Manchester M13 9PL. Quote ref: 51779/CW.

## THE LONDON LIFE ASSOCIATION LTD. COMPUTER OPERATIONS SUPPORT STAFF

Does your current post offer:

Staff Mortgage      Free lunch  
Flexible Hours      Generous Holiday  
Non-Contributory Pension Scheme  
And a Competitive Salary

The London Life Association Ltd., in Surrey, can offer all this plus a challenging career within the Computer Operations Support Section.  
We are currently operating an ICL 1902T (128K) machine. All applicants must have sound experience of ICL 1900 type hardware, together with an in-depth knowledge of Geopac or 2s. Some experience of implementing Data Capture would also be required.  
All salaries are genuinely negotiable according to experience and qualifications.  
Please write or telephone:  
The Personnel Department  
The London Life Association Limited  
2 Marshalls Road, Sutton, Surrey  
Telephone: 01-643 8010

## PROGRAMMERS HAMMERSMITH AND NOTTING HILL GATE

A major International Group of Civil Engineering Consultants and Architects have two vacancies for experienced Programmers, one in their Hammersmith office and one in their Notting Hill Gate office.

Duties will include assistance in running Prime 300 and computers, assistance to users and responsibility for maintenance of the computer hardware. The persons appointed will design, write, document and prepare Fortran programs to engineering problems; at Notting Hill Gate there will be other scientific and commercial programs.

Candidates must have a degree in engineering, science or mathematics or a HND in computer studies. A thorough knowledge of Fortran is essential and applicants should have a minimum of two years' computing experience, ideally in an engineering or scientific environment, over and above the experience acquired at University or College.

The salary will be related to the qualifications and experience of the selected candidates. Additional benefits include non-contributory pension and group PPP schemes. Flexible working: 20 days' annual holiday.

Please apply in writing, quoting ref: 1787 and enclosing a brief but comprehensive c.v. to:

M. W. RAMSAY  
Director of Personnel  
SIR WILLIAM HARGREAVES AND  
PARTNERS  
Newcombe House  
45 Notting Hill Gate, London  
W11 3JX



## SOFTWARE ENGINEERS

Do you have two to three years' experience programming microprocessors or minicomputers at assembly level? If so there is an opening for you in our active, expanding Research and Development Department.

We currently have vacancies for two Software Engineers to work on microprocessor-based designs and take responsibility for their software development.

The Department is active in a variety of fields including Research, Electronics, Computing and Precision Engineering, giving the successful applicants the opportunity to develop skills solving a wide variety of problems.

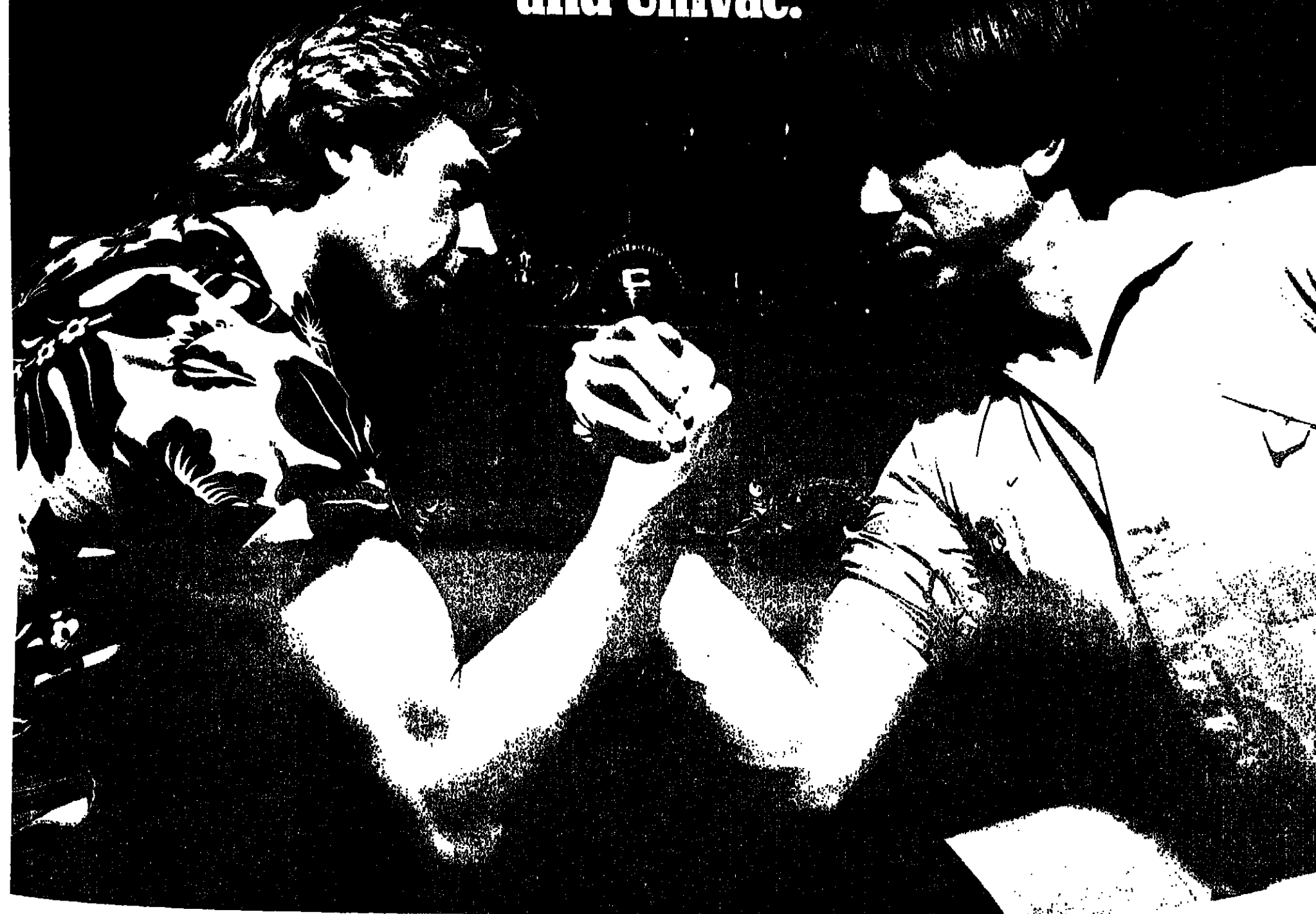
Applicants should hold a suitable degree or other equivalent qualification, and have worked with at least two of the following systems: PDP11/LS111, RT11, RSX11, IAS, M6800, 2801, 8080. An understanding of computer hardware would be a distinct advantage.

The Department is currently based in London, EC1, but will be able to offer the opportunity to work to the west of London in the near future. An excellent benefits package is offered, including a non-contributory pension scheme, free life assurance, free staff restaurant, and relocation assistance.

The appointments would be financially attractive to those currently earning around £6.5k.

Please write to: M. H. Bormann, 2 Charterhouse Street, London, EC1, for an application form, giving brief details of your career, and a telephone number where you can be contacted.

I'd like to hear from  
ambitious Field Service Engineers  
from companies like  
Burroughs, Honeywell, DEC  
and Univac.



I've a challenge  
you'll find hard to resist

I have been retained by a major computer company to interview Field Service Engineers who want to improve their career prospects.

For this reason I would especially like to talk to people who feel that their capabilities aren't being stretched to the full in their current job.

The company I represent is among the fastest growing computer companies with a multi-million pound investment in facilities, equipment and people throughout the world.

They have a wide range of interesting and advanced systems that are being used in business, science and industrial applications. Because of the company's continued growth in all these areas they need experienced Field Service Engineers for locations in the UK, particularly in the London area. Those who can prove themselves can expect promotion very quickly.

Don't worry if you feel your present experience is too limited. The company is making a major investment in a new training centre to be located in the UK. Here Field Engineers will be continually updated on their product range and Field Engineers joining this company will receive special training.

I can promise men or women a more interesting and worthwhile career plus an excellent salary package. All enquiries will be dealt with in the strictest confidence and your name will not be passed to our client without your permission.

Interviews will be held in London and you are asked to phone Mike Chapman at the address below:



GROSVENOR ASSOCIATES  
22 South Audley Street, London W1S  
Telephone: 01-493 0837  
INTERNATIONAL RECRUITMENT CONSULTANTS

Apply by 1.5.80



**South-East Thames Regional Health Authority**

**REGIONAL COMPUTER CENTRE**

**Project Leader**

**SCALE 14 — (£5,891-£7,069)**

We are looking for a systems analyst to take responsibility for the financial systems project team. This challenging post will provide experience in supplies, accounting and estate management systems run on an ICL 1904S. Regional implementation of the supplies system is planned and Radfon equipment is to be used to link the supplies departments to the Regional Computer Centre.

We provide computer services for hospitals and Health Authorities in South East England. The Centre employs about 150 staff and the mainframe computer is an ICL 1904S with discs, tapes, printers, communications processor and MOP terminals. In addition, there are ICL 2904 computers dedicated to remote transaction processing sites at a Health District and an Area Health Authority, both linked to the mainframe.

We are also currently investigating the use of micro-processors for distributed processing applications within the Region.

The Centre is situated in the grounds of Lambeth Hospital, close to the Elephant and Castle. It is accessible by public transport and free car parking facilities are available.

For further information and an application form (returnable within two weeks of this advertisement appearing) telephone or write to: The Regional Computer Services Officer, South East Thames Regional Health Authority, Regional Computer Centre, Brook Drive, London SE11 4TH. Telephone: 01-735 0071, ext. 38.

**Project Leader**

**Salary up to £6702**

To lead teams of programmers/systems analysts on full range of Council's computer activities. Candidates must be experienced COBOL programmers with up to two years' systems analyst experience. Job description available.

**Systems Analyst/Programmer**

**Salary up to £5568**

To work in project team initially on police command and control systems using dual specialist equipment backed by main frame, developing and maintaining communication and general systems employing CORAL and COBOL. The post will allow contact with specialised techniques and the occupant will be able to widen experience to the limits of ability.

The Council's computer equipment consists of a Honeywell level 66/10 and level 6 processors.

Application forms and further details for the above posts are available from the Personnel Officer at County Hall, Bedford. Telephone: 0234 63222 Ext. 107, to whom applications should be returned by: June 15th, 1979.

**Bedfordshire**

COUNTY COUNCIL

**PROJECT LEADER**

(Salary up to £7,230 p.a. inclusive of supplement)

**SENIOR DEVELOPMENT OFFICER**

(Salary up to £6,080 p.a. inclusive of supplement)

The City Council plans to install a 2 1/2 megabyte ICL 2960 Computer in October 1979 to replace an ICL 1904S Computer running under George III. An ambitious conversion and development programme of work is planned with an emphasis on communication and data management software.

Applicants for the position of Project Leader should have at least five years' relevant data processing experience, two of which should have been in a senior systems capacity, and for the position of Senior Development Officer, a minimum of three years' relevant data processing experience.

A salary award is expected to be applied from 1st July 1979 and the City Council offers an attractive relocation package which includes 100% removal expenses, reimbursement of local fees, temporary lodging allowance, furniture storage expenses, incidental expenses and mortgage facilities in appropriate circumstances.

Application forms are available from the City Treasurer, Civic Centre, Newcastle-upon-Tyne NE99 1RD, and should be returned by 18th June, 1979.

For further details ring Mr. A. Maughan on Newcastle 28520, extension 310.

**City of Newcastle upon Tyne**

**PROGRAMMER FOR NIGERIA**

A proven programmer preferably with a banking background, is required for service in our associate company in Nigeria. Experience in ICL COBOL/PLAN and ICL 2900 Series Equipment essential.

Position in a small development team offers considerable challenge involving wide all round responsibilities. Plans include use of package developed in UK to transfer accounting to a 2904 machine.

Emoluments in Nigeria will be not less than N16500 per annum (approx £13,000 per annum at current rate of exchange). Fringe benefits include free furnished quarters in Nigeria, non-contributory pension scheme (subject to satisfactory medical), local Nigeria medical scheme etc. The assignment will be for up to 2 years initially during which period there will be generous home leave with passages paid. Thereafter term may be extended by mutual agreement, or successful applicant will be offered a position within our Computer Services Department in Poole or elsewhere overseas.

If interested, please write giving full details of career to date to:

Colin Maloney, Head of Development, Management Services Division, Barclays Bank International Limited, 1 Wimbome Road, Poole, Dorset BH15 2BB.

**BARCLAYS International**

**ANALYSTS & PROGRAMMERS**

The Southern branch of our parent company, GOULD COMPUTER SYSTEMS, currently need all grades of systems personnel, for work in the software house environment.

We have clients in all areas of the South of England, from Luton to Brighton and London to Bristol.

The sort of people we are looking for will be responsible professionals, who want to be a part of a small, rapidly-growing company, and able to contribute to its success.

Salary range £4500-£7000 + expenses, and car option after 2 years.

Or if you are a Freelance, with a professional attitude, or contemplating freelance work, give us a ring — it can only be to your advantage.

Whatever your skills — IBM/DEC/Univac/ICL/Datapoint or Payroll/Accounting systems —

Ring Jack Paddon on Swindon (0793) 46701 or write with cv to —

**Project Recruitment Limited**

158 Victoria Rd. Swindon, Wilt.

**IN-HOUSE ENGINEER — WEST COUNTRY**

**TO £5.5K + BENEFITS**

An expanding distributor of electronic/mechanical equipment to commerce urgently seeks a talented in-house electronic engineer. Micro technological developments within the industry have created a vacancy for someone wishing to keep pace with one of Britain's brightest growth sectors. Knowledge of printed circuitry and the use of oscilloscopes together with an H.N.C. (or equivalent), in an electronic discipline are the only requirements necessary.

The rewards include:

1. The opportunity to keep pace with micro-technology
2. An above-average starting salary
3. The possible provision of a company car

Take your first step into the future by phoning: A.B. EXECUTIVE (BRISTOL) LTD. Recruitment Consultants Tel: Bristol 0272 426631

**FORTTRAN**

**ENGINEERING SCIENTIFIC BACKGROUND**

CONTACT US, THE SPECIALISTS IN THESE FIELDS

We urgently require Programmers with experience of Fortran, Assembler, Cnal or Basic for Real-time Applications.

Jobs from £3,500 to £8,000 in all areas. Phone now for a free list of vacancies

Capital Appointments, 28 Windmill Street, London, W1. Telephone: 01-637 8561 (day) — 01-636 9858 (eves.)

**ICI Central Toxicology Laboratory**

This laboratory provides advisory and experimental services to ICI Limited, for the control of toxic hazards in manufacturing processes and in other fields of growing importance, such as the development of pesticides and food additives. Emphasis is placed on improving and assessing methods for studying the biological effect of foreign compounds and upon understanding mechanisms of toxicity. The provision of toxicological information, prior to product clearance and registration in many countries, is a major activity undertaken by the Laboratory on behalf of the ICI Group.

**Operations Controller Computer Services Group**

The Central Toxicology Laboratory is introducing a data handling scheme to store and analyse the data generated by the toxicity tests it carries out for Divisions. The Job Holder will be responsible for the correct, secure operation of the system which is based on a Data General M600 mini-computer. This will include the supervision of other operating staff. He/she will also be involved in the development of the operations environment of the new system and in the use of computer hardware throughout the Laboratory.

Candidates should have an engineering (or computer science or similar) degree (or equivalent), and/or previous working experience in a mini-computer environment with on-line systems. Supervisory and administrative experience and the ability to take decisions on system operating parameters quickly and clearly would be desirable.

You would be working two miles south of the village of Alderley Edge on the main road (A34) between Manchester and the Potteries on a 300 acre site which the Laboratory shares with ICI's Pharmaceuticals Division. Alderley Edge is less than 20 miles from Manchester and in addition to the well-wooded Cheshire countryside which surrounds it, Alderley is within easy reach of the Derbyshire Peak District, the Lake District and the North Wales Coast. Staff working at Alderley live over a wide area but mainly in the Macclesfield and Alderley Edge/Wilmslow area.

The salary for this vacancy is around £4400 plus a productivity bonus and there is a Profit Sharing Scheme. A contributory Pension Scheme is in operation and after joining, staff receive a reasonable refund of removal expenses.

Applicants, male and female, should telephone or write for an Application form to: Mr. Andrew Blain, Assistant Personnel Officer, Central Toxicology Laboratory, Imperial Chemical Industries Limited, Alderley Park, Nr. Macclesfield, Cheshire SK10 4JT. Telephone: Alderley Edge (0625) 582711. Please quote Ref. No. OC/SS/JM. Closing date for applications: June 30th. Overseas candidates should only apply if they have a planned visit to the UK within the next two months.

**ICI**

**OPERATIONS SERVICES OPERATOR.**

**OPERATING EXPERIENCE ESSENTIAL.**

You probably started the hard way, at the bottom. Are you still stuck there after one or two years? You could be working for a company that's rapidly getting to the top.

Right now Comshare is moving faster than any other specialist services agency in Europe.

**YOUR SECOND OR THIRD JOB?**

We are not looking for a job hopper but someone with a full knowledge of computer basics. You will be working in a fast thinking environment and need a more than average understanding of operating skills.

**CARRY YOUR WEIGHT.**

By now you'll realise we need someone a bit special who needs to realise his potential.

Your duties will be to augment Comshare's operators by being responsible for the vast array of non-standard mag tape operations, graph plotting, card and paper tape operations and if that doesn't keep you busy there will also be administrative duties to perform.

**THE PRIZE FOR HARD WORK AND INITIATIVE.**

The starting salary will be in the range of £4,250 to £4,500 per annum plus L.V.'s and B.U.P.A. But for the right person there will be the facility to progress without having to change jobs again.

Write to Vince Blackhall at Comshare Limited, P.O. Box 197, London SW3 5RL. Or phone him on 01-351 4399.

**COMSHARE**

Making the computer make sense.

**SHOP LTD.**

Our client, the Ministry of P.T.T. Riyadh, urgently requires following personnel for IBM 3031 computers:

- **SYSTEMS ANALYSTS £27K P.A.**  
Min 5 yrs. exp. in computer systems work
- **COMPUTER OPERATORS £20K P.A.**  
Min 3 yrs. exp. as Computer Operator
- **UNIT SUPERVISORS £20K P.A.**  
Min 3 yrs. exp. in data processing to include one of the following fields:
  - (a) Scheduling on I/O control
  - (b) Job set up or production control
  - (c) Operation, programming and interface.

Above salaries are maximum depending on experience and qualifications.

Please ring 01-801 4321, Sheikh-Hashmi, Overseas Personnel Ltd., 6 Walton Road, London N15 4PP

**SYSTEMS DESIGNERS LIMITED**

*Quality first*

**We are confident of a successful and exciting future. ARE YOU?**

Systems Designers Limited needs computer professionals at all levels to work in very nearly every field of computer operation, not only in the UK but also in Europe, the Middle East and the USA. Although a large amount of work is centred around our Camberley, Farnley and Manchester offices there are many long term projects which offer opportunities to see other countries throughout the world.

Our continuing requirement is for staff at all levels. We are looking for final year graduates as well as experienced software and systems professionals. Salaries are negotiable up to £12,000 p.a. according to ability and experience.

Systems Designers controls and encourages the career progression of its staff giving them a wide variety of experience of both project applications and computer systems.

The company runs productivity bonus, insurance and pension schemes and offers assistance with relocation.

Telephone Ann Gregory for an application form and further information about the company or write to:

Bill Hockley, Operations Director, Systems Designers Limited  
1 Pembroke Broadway, Camberley, Surrey GU15 3XH  
Telephone Camberley (0278) 82244

Our principal work areas are currently:

**COMMUNICATIONS:** Message switching, telex systems, Communications management systems, computer communications.

**INDUSTRIAL:** Process control and monitoring, plant control simulation, high speed data analysis, distributed microprocessor system.

**MILITARY:** Modelling, avionics and radar systems, complex rigs, simulators, microprocessor missile systems.

**SOFTWARE PRODUCTS:** Compiler technology, software design techniques, MASCO, information processing systems, STATUS and VIEWDATA systems.

**CONSULTANCY:** Complex military systems, software and systems development technology.

**TECHNICAL SUPPORT PROFESSIONALS...**

**DISCOVER HOW TO REVIVE YOUR ZEST FOR LIVING AND YOUR CAREER...**

Who gets all the credit in computers? Just about everyone but the boys (and girls) in the backroom. It's all too easy to ignore the technical support role, yet the major and rapid advances in computer technology now make it an integral, vital, and profit making part of the sales operation.

Our client — a major name in commercial computing and one of the most exciting companies in its field recognises the role of the Support Professional for the important contribution it makes to its business.

Their success is second to none and they have bold plans for the future. In the next few years they plan to develop their service, their creativity and their share of the market to become unassailable leaders in their field. Now they are looking for more of the talent that will take them there.

Their immediate need is for more support staff to join both new and existing teams providing support to the many services offered. For the more experienced applicant there are real management roles requiring confidence and initiative. All successful applicants can expect a challenging and changing environment.

Your career will be developed with both formal and informal training and by interchange within the department. In addition real opportunities are present within the organisation as a whole.

You will work in a team developing or supporting one of the services offered which include G3 and VME/B with the emphasis of telecommunications. Further services are planned for the immediate future to meet the organisations aim to be at the forefront of technology. Salary will reflect experience but will not be less than £5,000 p.a. with exceptional candidates earning up to £9,000 p.a.

Ideally you should have experience in one of the following areas:

- Senior operations on a large ICL system
- Support of a large comms network
- PLAN programming
- VME/B or G3 support
- JCL or SCL writing

Give your career a new lease of life by telephoning Steve Gardner between 9.30 pm & 7.00 pm, quoting ref: 553, on 01-836 1385 at Moxon Dolphin & Kerby Ltd., 60 St. Martin's Lane, London WC2N 4JB.

**MOXON DOLPHIN & KERBY LTD**

*People always ignore us in technical support... why get wound up about it?*



## An exceptional opportunity in computer systems training

Data Logic's Terminal Systems Division is one of Europe's leading suppliers of intelligent terminals and distributed processing systems. Our users come from government, industry and commerce. We are engaged in an ambitious expansion programme aimed at more than doubling turnover in the next five years. This will create extremely attractive prospects for career progression.

We require a Training Officer to take responsibility for both customer and internal staff training. He or she will plan and prepare courses on the Division's hardware and software products. The courses will be given in-house and at customer sites throughout the country. The Training Officer will also control demonstration areas and systems at our new headquarters in Central London, now being equipped to the very highest standards.

**Data Logic**

Write or call quoting reference TS/04:  
Kathy Martin  
Data Logic Limited  
29 Marylebone Road  
London NW1  
01-486 7288

A Raytheon Company

## Apply your Computing Knowledge to Business Planning

Unilever have an opportunity for an assistant, experienced in computer data control, to join a small team located at their Blackfriars Head Office, involved with developing and operating mathematical models for Business Planning. The assistant would, after training, assume responsibility for the operation of a group of existing models, and assist in the development of new models or the adaptation of existing ones.

Suitable applicants should have 'C' and preferably 'A' level mathematics, be experienced in computer operations, and be able to demonstrate the qualities necessary to cope with a varying workload and working with minimal supervision. Starting salary dependent on age and experience. Company benefits include contributory pension scheme, four weeks' holiday, subsidised staff restaurant, company shop, social club and interest-free season ticket scheme (after six months).

Please write or telephone for an application form:

Miss Elizabeth Pingstone, Staff Department,  
Unilever UK Central Resources Limited,  
Blackfriars, London EC4P 4BQ,  
01-822 6157.

**W**

UNITED KINGDOM ATOMIC ENERGY AUTHORITY

**Culham**  
Laboratory

requires a

## SENIOR ANALYST/PROGRAMMER

to lead a small team engaged on the unification of a new computer system involving the use of two PRIME 500 computers in an 8 Mbyte ICL 2976 complex with links to other computers.

Salary in the range £5514 to £9053 (currently under review).

If you have experience of a similar project and of communications techniques generally, and possess a good Honours Degree write for further details and an application form to:

Mrs. D. Townsend, Personnel Department, UKAEA  
Culham Laboratory  
Abingdon, Oxon OX14 3DB

or telephone 0235 21840, ext. 250



**MOTOROLA**

## ELECTRONIC ENGINEERS

THERE ARE GREAT OPPORTUNITIES FOR YOU AT WEMBLEY IN

**MPU**

WE'RE LOOKING FOR

## SALES, MARKETING AND APPLICATION ENGINEERS

WITH HANDS-ON EXPERIENCE, A KNOWLEDGE OF MICROPROCESSOR DESIGN AND SMALL COMPUTERS - AND THE CONFIDENCE AND PERSONALITY TO LIAISE WITH PEOPLE AT ALL LEVELS.

SALARIES AND CONDITIONS ARE EXCELLENT

Don't Delay! Contact Douglas Stewart, Marketing Controller,  
Motorola Semiconductors, York House, Empire Way, Wembley,  
Middlesex HA9 0PR. Or telephone 01-902 8836.



**MOTOROLA**

THE POLYTECHNIC OF CENTRAL LONDON  
School of Engineering and Behaviour  
TEMPORARY FULL-TIME LECTURERS IN  
DIGITAL ELECTRONICS  
As a consequence of our expanding  
commitment to education in all aspects  
of computing and digital electronics, we  
are seeking additional lecturers to join  
our developing activities in these areas.  
Applicants should be able to lecture  
at levels from Higher Diploma to M.Sc.  
and preference will be given to those  
able to contribute to our short course  
program or our research and develop-  
ment program. We are interested both  
in commercial and in scientific ap-  
proaches including on-site and terminal  
access facilities, we are able to use and  
teach on any of our wide range of  
main-frame, mini and micro computers.  
Appointments will be for a period of  
the bottom of the L11 Scale O4575-07022,  
initially on a one-year contract with the  
possibility of an extension for a second  
year.  
We also seek some part-time lec-  
turers who would be offered 8-month or  
1-year contracts at £5.55 per hour. The  
number and balance of appointments  
made will depend on the areas of ex-  
perience offered by the applicants.  
Application form and further details  
from the Establishment Officer, PCL,  
309 Regent Street, London W1R 6AL  
(Tel 01-580 2020 ext. 212)

## PROGRAMMERS & OPERATORS

FREE LIST  
of vacancies to suit you  
ALL AREAS  
Phone now 01-626 0171

The best CHOICE of  
Computer Appointments  
CICKET  
129 Cannon St.  
London EC4A 3DF  
Tel. 01-626 0471

IBM OS COBOL  
IMS WOULD HELP  
USA  
\*20K-30K  
Ring Joanne Stone  
01-278 6426 (Day)  
0865-773879  
Eves/Weekends

## REDIFON PROGRAMMERS

A software company wishes  
to compile a list of currently  
active freelance programmers  
in Southern England.

Reply in confidence to Box  
1022, Computer Weekly.

## START ON A NEW PROGRAM TODAY

Opportunities in Advanced Software Development

### Opportunities in Advanced Software Development

We are Europe's leading manufacturer of Automatic Test Equipment (ATE). Our continuing growth means that we now have a number of opportunities for you to join our young and expanding Software team, using advanced structural development techniques for design and implementation of ATE Software.

The team is now preparing further additions to the MB7700 range of ATE based on our own in-house micro-processor controller. The work includes:-

- \* High-level language compilers
- \* Automatic program generation
- \* Advanced fault diagnosis algorithms
- \* Sophisticated program debug packages
- \* Micro-processor system development.

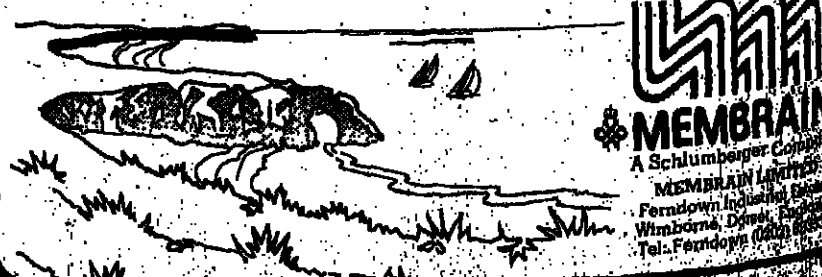
Whilst a knowledge of Automatic Test Equipment would be an

advantage, the typical requirements are education to degree level, preferably in computer science or electronics, and up to one year's experience, ideally in a scientific or technical environment, together with familiarity with languages such as Algol or Coral 66.

We are located in an attractive part of Dorset, with realistic house prices, close to Bournemouth and the New Forest.

We offer excellent starting salaries, depending on experience. Other benefits include a profit-sharing scheme, flexible working hours, four weeks annual holiday and, where appropriate, generous assistance to help you relocate to this area.

Telephone Steve Thurlow on Ferndown 893535, or, alternatively write sending details of your qualifications, experience and salary expectations - START ON A MEMBRAN PROGRAM TODAY.



**MEMBRAN**  
A Schlumberger Company  
MEMBRAN Limited  
Ferndown Industrial Estate  
Wimbome, Dorset, BH20 4JH  
Tel: Ferndown 893535



## Move into a new computer world with Halfords

It is unlikely that you will find a better offer in computers this year!

Not only will you have the rare experience of moving in on a new ICL 2950 installation and playing a key role in the design and implementation of a completely new programme: You will also be in a prime position to advance your career and your promotion prospects as our ambitious development plans unfold.

But that's only part of the story.

Our offices are located at Redditch in the heart of the beautiful Worcestershire and Warwickshire countryside. Housing is cheaper than in Southern England and we will give you a generous relocation allowance into the bargain.

Of course, living near Redditch doesn't mean that you're socially out to grass. In fact you will find life offers far more variety in every sphere of interest, and with little or no commuting problems there is more time left to enjoy life to the full!

You will be working for the leading retailer in Europe specialising in the motoring, cycling and leisure markets.

Apart from our 350 retail outlets, other Halfords interests cover wholesale cash and carry warehouses for motor accessories, our own cycle manufacturing plant, a cycle accessory wholesalers and a retailing chain in Holland.

With such a wide and varied range of Halfords products and activities it's not surprising that our plans through to the 1980's lean heavily on a committed computer programme.

## ANALYSTS/PROGRAMMERS (UP TO £6,750)

## SYSTEMS ANALYSTS (UP TO £7,500)

The challenge presented by the unique problems encountered within our retailing outlets will tax the ingenuity of the successful

applicants and test the capability of our 2950.

That's why we're looking for the most experienced people in the field to join us at Redditch.

The job demands an ability to work with senior executives in a variety of functions and to motivate systems staff.

There are also very good promotion prospects within this rapidly developing and important field.

## SENIOR PROGRAMMERS (UP TO £6,450)

## PROGRAMMERS (UP TO £5,600)

We need programmers with at least one or two years experience to implement the systems planned for our new computer installation.

Cobol knowledge would be useful, but not essential. We are prepared to retrain people who demonstrate aptitude and ability.

You will find the immediate tasks very rewarding and promotion opportunities outstanding.

If you are interested in any of these vacancies, write to us giving details of your experience to date, together with your present salary. Or telephone to make an appointment to come and see us. We will soon be holding interviews at various locations around the country and one of them could be near you!

Write for more details to:

## HALFORDS LIMITED

Mr. L. T. Richards,  
Halfords Limited,  
Icknield Street Drive, Washford West,  
Redditch, Worcs. B98 0DE

**HALFORDS**  
A BURMAH GROUP COMPANY

01-278 6426



## Burlington Industries

(IRELAND) LIMITED

Burlington Industries (Ireland) Ltd, a subsidiary of Burlington Industries Inc, a major textile company has vacancies at its Gillogh plant, near Limerick city, southern Ireland for:

### ANALYST PROGRAMMERS (2)

£6,000 + p.a.

The successful candidates will be experienced in at least one of the following languages: RPG 11, Cobol, Assembler. Familiarity in programming for on-line systems preferably using IMS would be advantageous. Present computer configuration is 512K Sperry-Univac 90/30 running under OS/3. Attractive salaries will be offered and a comprehensive pension and benefit package will apply. The company offers a challenging career with the prospect for further advancement. Relocation expenses will be paid where appropriate. Please telephone Lyn Thorne, Personnel at London 734 8242 or send written application to: Mr. Lyn Thorne, Personnel Manager, Burlington International A.G., Regent Arcade House, 19/25 Argyll Street, London W1V 1AA.

Closing date 10 June 1979.



Burlington Industries  
(Ireland) Limited

Gillogh, Longford,  
Tralee and Tullamore.

### ANALYST/PROGRAMMER

Age 25-35, for expanding group of companies situated in Swanley, Kent, with associate companies within EEC and Scandinavia.

Sound experience in Application Programming is essential. Previous analytical experience advantage. Applicant to be responsible for the department's IBM CALL Terminal and development of timesharing applications/systems reporting. Training will be given.

Send personal application outlining education and experience, with particular reference to business areas already worked.

Apply:  
June Young/Personnel Management  
IESB (UK) LTD  
S & A House  
Azalea Drive  
Swanley, Kent BR8 8HY

### SYSTEMS PROGRAMMERS UP TO £5384

Vacancies exist in our Technical Support Team for Systems Programmers to assist in the creation, maintenance and development of VME/8 (including T.P. and MAC) and System A.J. level, running on our ICL 2960.

These vacancies provide the opportunity for Junior Systems Programmers to develop their career and for suitably experienced applications programmers to widen their horizons by moving into this specialist and demanding field.

Application form from the Chief Executive, 60 Woolwich New Road, London SE18 6HQ (Tel. 01-854 8888, Ext. 2034).

Closing date: 15th June, 1979.

The Council is an equal opportunities employer. All applicants will be considered, irrespective of sex or country of origin.

## GREENWICH

## Computer Operator

### South Wales

Inco Europe Limited is part of a multi-national Company employing over 52,000 people throughout the World, and operates a modern nickel refinery at Clydach, near Swansea, South Wales.

Recently an IBM 370/125 Computer has been installed and, to ensure that it operates at maximum efficiency, we require an additional operator to join a young and dynamic department.

You should have 1/2 years operating experience preferably using DOS/VS and POWER/VS on IBM equipment and be capable of working without close supervision.

Salary will be competitive and other benefits include a non-contributory Pension and Life Cover Plan.

Please write or telephone for an application form to:

David Thomas,  
Senior Personnel Officer,  
Inco Europe Limited,  
Clydach Refinery, Clydach,  
Swansea (Tel. Clydach 852501).

## INCO

INCO EUROPE LIMITED

## FIELD SERVICE ENGINEERS

- \* ABOVE AVERAGE SALARY
- \* EXCELLENT COMPANY BENEFITS
- \* PROMOTION PROSPECTS
- \* COMPANY CAR

Bunzl Data Systems is part of a major International Group. Due to rapid expansion of the company we now require Field Service Engineers to operate in the Northern Home Counties based at our head office in Amersham.

We have become one of the largest Dec OEMs in the country and are looking for people with experience in the minicomputer field — preferably on Dec Equipment.

## bunzl

In the first instance contact  
Stephanie Worboys on  
Little Chalfont (02404  
4488) or write to the Field  
Service Manager, Bunzl  
Data Systems Limited,  
Meteor House, White Lion  
Road, Amersham, Bucks.

## IDMS CONSULTANT

PERMANENT or CONTRACT URGENTLY required for 6-12 months assignment to ORGANISE and IMPLEMENT an IBM DDS system for our client's INSTALLATIONS in CAMBRIDGESHIRE and NORTH AMERICA.

Contact Ian Gold or Bob Carr on 01-388-0036  
FRASER WILLIAMS (London) LTD  
38 Warren Street  
London, W1P 8PD

## Fraser Williams

### Computer Consultants

£10K+  
APPOINTMENTS

pages begin June 7

Ring Eddie Farrell  
01-261 8097

## Senior Systems Analysts:

### Let's get straight to the point in Wembley

If you've had at least four years experience of business systems development, we want to talk to you. Because you are one of the people who can help us to develop sales order and billing systems for our European network, it's a large scale operation based on IBM equipment.

Join us in London and you'll be with a major international group whose widely diversified interests are in chemical, natural resources and consumer products. More important to you, our broad spread of activities — and our

continuing expansion — is a virtual guarantee of attractive opportunities now and in the future. We'll be depending on creative men and women to keep pace with our growth.

Rewards for Senior Systems Analysts include excellent salaries, top line benefits, European travel and a great deal more. For all the details, in confidence, phone or write to Keith James, Data Processing Manager, W. R. Grace Ltd., Northdale House, North Circular Road, London, NW10 7UH. Tel: 01-965 0611.

## GRACE

## U.S.A. PROGRAMMERS

We have a number of urgent requirements for computer personnel in the U.S.A. Most of the assignments are centred in the Mid-West and Southern areas of the U.S.A. and are for a period of 12 months.

We would like to hear from programmers with 2-4 years' experience of IBM OS, IMS, COBOL and TSO.

In addition we are looking for a database designer with 4 years' specialised knowledge of database systems work in an IBM, VSAM MFT, COBOL environment.

For further details ring Keith Phillips at:



Project  
Recruitment  
Limited  
Licence No. M587

Fifth Floor  
Scala House  
Holloway Circus  
Birmingham 1  
Tel:  
021-643 5118/9

## DUNDEE COLLEGE OF TECHNOLOGY

### DEPARTMENT OF MATHEMATICS AND COMPUTER STUDIES

As a result of an expansion of the Department's degree and diploma teaching commitments applications are invited for the following posts:

### A) SENIOR LECTURESHIP/LECTURESHIP IN COMPUTING

The successful applicant will have an active interest and proven research record in one or more of the following areas: Computer Science, Systems Software, Computer Architecture and Microcomputers. For the senior lectureship level he/she should also possess substantial experience in teaching and of course design and validation procedures.

### B) LECTURESHIP IN COMPUTING

The successful applicant will be well qualified in computing or computer science and have commercial computer experience in systems analysis and design.

Salary Scales:  
(presently under review)

SENIOR LECTURESHIP — £7155-£7962 (BAR) — £9042  
LECTURESHIP — £4068-£7187 (BAR) — £7598

Further particulars and application forms may be obtained from the Administrative Assistant (Establishment), Dundee College of Technology, Bell Street, DD1 1HG. With whom applications should be lodged by 15th June, 1979.

## PERMANENT OR CONTRACT

### EUROPE/LONDON SALARY A.I. NEG

Informatix has been retained by leading systems and software groups to recruit the following:

Message switching staff — Holland  
Data comms/emulator staff — Germany

COBOL Programmer — Denmark

RPGII COBOL — London

Aeronautical Engineer  
Programmers — Germany

Final interviews will be held in London during June.

| POSITION                     | SALARY              | EMPLOYER               | LOCATION          | HARDWARE ENVIRONMENT       | SOME OF THE QUALIFICATIONS  | REF. NO. |
|------------------------------|---------------------|------------------------|-------------------|----------------------------|---|----------|
| Perm/Cont Programmers        | Neg                 | Systems/Software house | North London/City | IBM Sys 3.32               | RPGII Programmers urgently required to work on the development of financial/commercial applications.  | Ref 22/1 |
| Analyst/Programmers Analysts | from £6,000 + Mort. | Banking/Insurance      | Essex/London      | IBM                        | Leaders in the insurance/banking fields need professional staff to develop/support advance systems using 1 P facilities.  | Ref 22/2 |
| Systems Analysts/Programmers | to £8,000 + Car     | Building materials     | Middx.            | ICL 1800 Series Gh + Minis | 3 years + experience required for these senior positions. First class opportunities for both Analysts and Programmers to develop a wide range of applications in a challenging environment. | Ref 22/3 |
| Technical Support Staff      | to £7,500           | Multi-national Group   | City              | IBM OS CICS                | An ideal opportunity for PL1 programmers preferably with IMS & DL experience to work on advanced on-line applications.  | Ref 22/4 |
| Applications Programmers     | to 45,000 DM        | Services organisation  | Germany           | Minis/IBM DQS              | D.P. Professionals with COBOL and preferably BASIC are offered permanent positions within this well established company.  | Ref 22/5 |
| IBM Systems Programmers      | AI Neg              | Software House         | Europe            | IBM OS                     | IBM OS Systems Programmers urgently required by clients throughout western Europe. Salary and conditions of employment are excellent.   | Ref 22/6 |
| Analysts & Programmers       | to £7,500           | Bureau                 | City              | IBM/PDP                    | Sound PDP, RSTS, BASIC + or IBM DB/DC required for challenging positions within this expanding organisation.  | Ref 22/7 |
| Systems Analysts             | c£7,000             | Software House         | Central London    | Minis/Mircos               | At least 5 years+ experience required with in-depth knowledge of assembly code. Familiarity with communications an advantage.   | Ref 22/8 |
| Senior Systems Analysts      | to £7,500 + Mort.   | Banking/Insurance      | Central London    | IBM                        | Excellent career prospects for Systems Analysts to develop advanced DB/DC systems. Previous banking/insurance experience preferred.   | Ref 22/9 |

## INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

### Haven Informatix Limited

24 Grays Inn Road London WC1X 8HR Telephone 01-831 6055 Telex 299539 HAVEN G

RECRUITMENT CONSULTANTS

## PROJECT LEADER/SENIOR SYSTEMS ANALYST

### TECHNICAL SUPPORT ANALYST

### SYSTEMS ANALYSTS

c. £8,500 + benefits

c. £8,250 + benefits

c. £7,000 + benefits

## ORION IS -

## ORION HAS -

### ORION NEEDS -

## ORION OFFERS -

An international investment bank set up in 1970 by six of the world's major banks and now has assets exceeding £1 billion. It is a successful organisation which has gained an enviable reputation in the international banking environment and it has a young and progressive management team which creates a stimulating working atmosphere for over 300 staff in modern city-based offices.

Recently ordered the latest IBM 4341 and 3730 system to support its integrated DB/DC and word processing developments. It has organised three development teams to implement systems in major departments in the Group.

A SENIOR SYSTEMS ANALYST to select and lead a team in the development of a foreign exchange/money market system from feasibility study through to implementation. Essential attributes include a sound education, preferably to university degree level, proven experience in the management and design of at least one major project, and the ability to communicate effectively at all levels.

A TECHNICAL SUPPORT ANALYST to assist in the design and implementation of an integrated data communication and word processing network. The successful applicant must be able to communicate with all levels of management, possess a working knowledge of CICS/VS and DQS/VS, and must be keen to further develop this technical expertise.

SYSTEMS ANALYSTS to start work on the business system design phases of the Bank's Investment Banking and Syndicated Loans projects.

An ideal opportunity to join an expanding team at an early stage of the development programme.

- PLUS: — an excellent salary  
— non-contributory pension  
— mortgage facilities at 2 1/2% interest p.a.

If you are interested you may like to attend an informal meeting at Orion to discuss our plans on Tuesday, June 5th or Thursday, June 7th between 5.00 p.m. and 8.00 p.m. If preferred, please ring or write to:

THE PERSONNEL MANAGER, ORION BANK LIMITED, 1 LONDON WALL, LONDON EC2Y 6JX TEL: 01-600 6222

## ORION



# REDIFON NEEDS MARKETING PEOPLE

Redifon Computers, the second largest British-owned Computer manufacturer, is starting a major new expansion programme. This will complement an existing programme that has led to eightfold growth in the last five years.

Career-minded people are now needed throughout the U.K. for marketing appointments.

## Are you eligible?

- 2 years' successful experience selling computers?
- Good educational background?
- Currently earning £9,000-£10,000 p.a.?
- Clean driving licence?
- Ambitious?

Tick the questions. If you score 4 out of 5 you could be selling the R-Range of data entry

and distributed data processing computer systems within months.

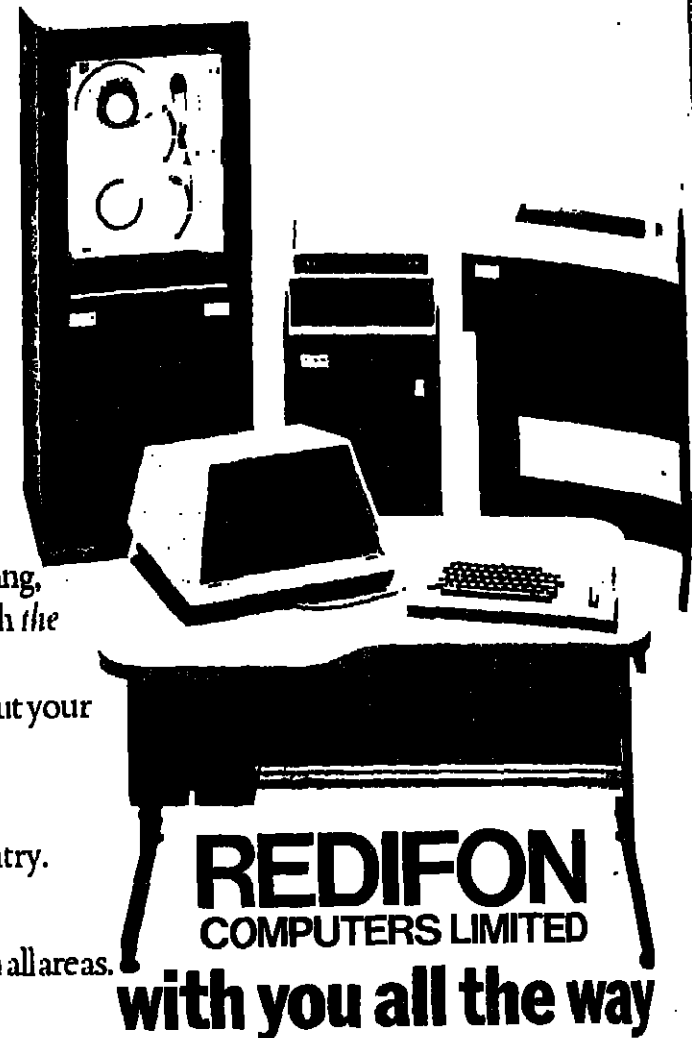
More than that, you could be established in a fast career development plan—backed up by thorough sales, marketing, technical and management training—with the British company.

Don't miss this opportunity to talk about your future. Call today:

Phil Northeast. Tel: 01-680 4756.  
London/South/East Anglia/West Country.

Barry Roberts. Tel: 01-499 6791.  
Major accounts and Financial Institutions in all areas.

George Snelgrove. Tel: 061-436 4114.  
Scotland/North/Midlands.



**REDIFON**  
COMPUTERS LIMITED  
**with you all the way**

Member Company of the Rediffusion Organisation

## Most software people think for only 25% of the time

Even at Section Leader level, too many people in two many companies spend too much of their time on coding and documentation. And not enough on original, creative thought. Working on one of Europe's key avionics projects, our client has achieved a better balance—a good 60% of thought with only 25% documentation, and a mere 10% coding.

In fact, they're so far ahead of the field that following precedent is as much use as following your nose in thick fog.

The approach is to discard conventional thinking and ready answers, and think everything carefully through from square one. If that's the way you like to work, you're a natural for our clients' environment, and for one of the new jobs their success is creating all the time. A job like one of these, perhaps.

### Section Leader

Your section would be one of several working on systems that will simulate the systems operating environment, and your people would handle technical design of specific parts of the system, working to very

tight requirement specifications. The man or woman our client is looking for will have at least three years' experience in mini-based real-time systems for scientific applications, for example, message switching or communications. Although your technical expertise is an important qualification, this is a job that will also test your own management ability.

### Recent Graduates

If you're a man or woman with at least a year's practical experience in real-time systems for scientific applications, and experience in a high level language or Assembler, you could step straight into an active, thinking role in one of our systems teams. If you want to use your brain to the full, in a company where the rewards and the promotion opportunities come in full measure, write to Position Number BWM 7330, Austin Knight Limited, London W1A 1DS. Applications are forwarded to the client concerned, therefore companies in which you are not interested should be listed in a covering letter to the Position Number Supervisor.

**AK ADVERTISING**

## Move into International EDP Audit

Your gateway to management

**c.£8,000**

City of London based

Worldwide Travel

What is EDP audit? The role of an EDP Auditor is to bridge that crucial gap between business management and the computer world. This involves the investigation and assessment of computer systems advising both management and computer departments on their correct usage.

Our client is one of the largest and most respected firms of Chartered Accountants in the world with offices in over 90 countries. An acknowledged leader in sophisticated audit techniques, they are now seeking to augment their successful computer audit group with several ambitious computer professionals.

Undertaking audit assignments for the company's clients at home and abroad you will assist in the development of techniques to examine data security and review procedures and controls employed in new and existing systems.

You should be a successful analyst in your mid to late 20s with around 3 years experience in the design of commercial systems and a broad overall knowledge of computer applications. You will have the ability to work on your own initiative and accept responsibility for dealing with user line management.

In addition to an excellent training programme which could lead to formal qualifications if desired, the company will be providing you with an ideal opportunity to develop your skills both inside and outside a data processing environment performing a consultancy function for international management. Excellent long term prospects exist to diversify into other areas of the company's business—a sound base from which to progress to senior management.

In addition to the excellent starting salary, benefits are in line with those normally offered by a large and successful multi national company.

Please telephone or write in the first instance to Graham Morgan ACA or Barry Latchford quoting Ref. 2388



**Lloyd Chapman Associates**

123, New Bond Street London W1Y0HR 01-408 1670

Our clients are a Swiss and U.K. based Data Communications Manufacturer. Their products are in the forefront of technology and they are enjoying substantial success in the OEM and End User Sectors.

The successful candidate operating out of their head office in the Bracknell area will take responsibility for the U.K., selling the most sophisticated range of computer and communications test equipment currently available and will be competent in dealing with all levels of commercial and technical management in this rapidly expanding market.

You can expect a high proportion of introductory business enabling you to meet the realistic quote, combined with excellent support that will ensure further market penetration.

Applicants should be self-motivated, confident and have a minimum of three years' successful sales experience in the communications environment.

## THE REWARDS

Base salary to £7,000 on quota earnings £14K to £16K plus company car of your choice in the 2-litre class. Free private patients plan for you and your family. Non-contributory pension scheme and bonus.

If the prospect of joining a young, professional, results orientated sales force and an organisation structure offering real career prospects interests you:

Contact Simon Lever on: 01-935 0671 or Lapworth 3272 (evenings and weekends).

London 01-935 0671 3 Mandeville Place, Wignmore Street, London W1M 5LB  
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY  
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA

Specialist Computer Recruitment Ltd

## Burroughs Operators

The International Systems Division of American Express, based in Brighton is seeking experienced

for its B1860 B1865 which is used to support systems development and production both utilising online facilities.

Successful candidates will have upwards of 12 months experience on a Burroughs computer and be prepared to work on a 5 day, 2 shift system.

Write, giving brief details or phone for an application form.  
Dennis Perreman,  
Central Personnel Department,  
Amex House, Edward Street,  
Brighton BN2 2LP.  
Phone Brighton 693555 ext 6512.

## Puzzle Answer

Trader is now on holiday. This column will be resumed next month. **SALES**

## COURSES

**CITY OF LONDON POLYTECHNIC**  
Profit and loss accounts, balance sheets, corporate taxation, group accounts, funds flow statements... 77

If these are things you need to know something about, then we have just the thing for you—

**A two-day introductory course to Financial Accounting**  
July 2 and 3, 1979

For further details phone Ellen Johnston, Short Course Unit, 01-408 1670

## County of Cleveland



**COMPUTER SERVICES UNIT**  
**SENIOR PROJECT LEADER**  
**PROJECT LEADERS UP TO £6,500**

The Unit provides a cost effective means of helping user departments optimise both functional efficiency and production economy. We have a wide range of openings for people with systems experience to work in project design and implementation.

The Computer Unit provides a wide range of services ranging from finance to computer aided design. We are currently seeking to fill three new posts in systems design, created by expanding work loads on our IBM mainframes.

**SENIOR PROJECT LEADER**  
£8,585-£9,513 (includes supplement)  
This is a senior position requiring a mature approach. You will be required to lead, train and advise staff in system design, for commercial systems. You will also take a lead in shaping the Council's telecommunications systems and data bases. Ref. CO.093/CW.

**PROJECT LEADERS**  
£6,232-£6,568 (includes supplement)  
Two posts have been created for Project Leaders. You will lead small teams engaged in commercial applications. You will be required to demonstrate original ideas, in areas of computing requiring high throughput efficiency. You will be responsible for systems design and implementation of systems utilising database and advanced teleprocessing techniques. Refs. CO.084/5/CW.

All these vacancies are involved in the Council's development plans, and the prospects for career advancement and job satisfaction are good. The installation is using CICS/VS, ANS COBOL and commercial enquiry packages.

Cleveland County has a population of 588,000. It is an area of contrasts. Within close proximity to the main centre is an outstanding coastline and the North Yorkshire Moors. The Computer Unit combines all the advantages of a small organisation with the benefits of a large company. In addition to our competitive salary, we offer the usual excellent public service conditions of service including 27 days holiday and restaurant facilities. Reimbursement for the removal of household effects is paid in approved cases. Temporary housing accommodation may be available.

For further information and application forms please ring Tony Whithead on Middlesbrough (0642) 248 188 Ext. 2360. Alternatively write to Colin Schneider, 5th Floor, Riddle House, 87 Corporation Road, Middlesbrough TS1 1LV. Please quote the appropriate reference.

**TRESHAM COLLEGE NORTHAMPTONSHIRE**  
**LECTURER II**  
**COMPUTING AND DATA PROCESSING**

Required from 1st September 1979 or as soon as possible thereafter to act as course tutor for the National Computing Centre 'Threshold' course and have overall responsibility for computer work at the Centre. Appropriate industrial experience/qualifications; teaching experience preferable.

Salary in accordance with BURTHAM 25 Lecturer II scale £4101-£5515 (under review) point of entry determined by experience and qualifications. Further details and application form from The Principal, Tresham College, Kettering Road, Northampton NN1 6BA. Telephone: Kettering 48334.



## LOOKING FOR VARIETY AND CHALLENGE? BASED IN (OR CLOSE TO) MANCHESTER?

You will be involved at all levels, especially senior, in all kinds of organisations and with a wide range of disciplines.

You will be active in a wide variety of computing applications in both the private and public sectors.

You will be responsible for controlling the development of powerful and well designed systems for improved management control.

ADP Network Services is an international company providing interactive computing services for managers and businessmen.

We believe in accessible management and promotion from within. We are always prepared to recognise and reward self-motivated individuals.

We provide a professional development approach for our customers and expect our staff to demonstrate their abilities and experience.

The kind of people we need will have experience of:

## ANALYSIS, DESIGN AND IMPLEMENTATION

You must be able to conduct the installation of a customer's system from the pre-sale stage through to the commencement of live running and be able to lead other members of project teams.

Education to 'A' level standard is generally expected together with the capacity for hard work and applications in tough situations coupled with a sensitivity to the requirements of others.

Ring: Bernard Edwards 01-580 3715 or write: Bernard Edwards, S & P Manager, ADP Network Services Limited, 2nd Floor, Peter House, St. Peter's Square, Oxford Street, Manchester M1 5AP.

**BERK HARTWELL TECHNICAL COLLEGE**  
College Gate, The High  
Hartwell, Watlington (OX11 1JH)  
DEPARTMENT OF  
MATHEMATICS AND SCIENCE

**LECTURER GRADE I**  
**in MATHEMATICS**  
**and COMPUTING**

Applications are invited from suitably qualified candidates for the above post, tentatively from September 1979. The lecturer is required to teach mathematics for GCE 'O' level and IGC in programming courses, together with computing for the City and County 247 Certificate. Recent experience in the field of computing is desirable. Salary scale: £1,182-£3,334 (plus £150 London Index). Application form and further details obtainable from the Principal.

## D.P. MANAGER

West Yorkshire

I AM A DISTRIBUTOR WITH A SMALL PDP 11 installation which will soon be unable to keep pace with the Company's rapid expansion. I would like to develop a larger real time system with terminals at each of my branches, and I would like to meet an experienced Systems Analyst/Programmer who is looking for a career in management. Starting salary would be negotiable at £6,000 plus and the package will include a company car and other fringe benefits.

If the idea of developing and managing your own thing appeals to you please write to: Box 1029, Computer Weekly, giving details of your career to date.

**FREELANCE PROGRAMMERS**  
Salary in £400 p.m.  
1 day a week  
UK & OVERSEAS  
Emp. Adv.

**01-935 3885**  
100, FOSTER LONDON W4 3JH

**BURROUGHS 18000 OPERATOR**  
Required for leading West London Auctioneers and Estate Agents based in W.12. Salary negotiable.  
Please Contact Willmott's 01-743 4444  
Ref. TMHM for further details